

THE IRON AGE

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New York, May 30, 1918



American High Speed Chain



Can You Bring
Yourself to Do It?

Evidence—but

are you actually willing to learn whether our chain is a dependable, economical and superior mechanism for the transmission of power?

Proof—but

having seen the evidence of success with chain drives elsewhere, are you really willing to install a test drive in your own shop where it may be judged by your own standards?

Conviction—but

with the proof of merit before you, have you the determination to equip your shop with chain drives wherever they may be properly used?

A few lines to us will put
the whole case in court.

ABELL-HOWE COMPANY
NATIONAL DISTRIBUTOR
CHICAGO



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KOPPERS OVENS

THE Indiana Coke & Gas Company of Terre Haute, Indiana, has contracted with H. Koppers Company for the construction of an addition of a battery of thirty KOPPERS OVENS to the present plant of thirty ovens.

H. KOPPERS COMPANY

Builders of the Koppers Oven
PITTSBURGH, PA.

THE IRON AGE

New York, May 30, 1918

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How Erie Is Solving the Housing Problem

Home-Building Work Being Carried Out by the General Electric and American Brake Shoe & Foundry Companies

THE housing problem has existed in Erie Pa., for several years, due to the steady growth of the manufacturing industries in that city, but this problem has become much more serious during the past twelve months owing to the great amount of Government work placed with Erie manufacturers. This has resulted in a steady influx of outside labor required to operate some of the large plant extensions built hurriedly to produce war material and has necessitated prompt action by manufacturers to supply housing facilities. Erie manufacturers realize that the labor and housing problems are closely allied, and that the general scarcity of skilled employees require efforts to attract outside workers to the city and will not be entirely successful unless adequate accommodations are provided for them.

A great deal of outside labor has been brought to Erie during the past few months, and this at present is being quartered to a large extent in private homes. Charges for board are high, conveniences are lacking, and the steady growth has made



Single Houses Sold by the General Electric Co. to Employees

it imperative to provide other housing facilities for the additional men that are to come. It is stated that 11,000 is a conservative estimate of the number of additional workmen who will be needed in Erie within the next

few months, this estimate being based on a canvass of all the manufacturing plants in the city.

Two of the largest employers of labor in Erie, the General Electric Co. and the American Brake Shoe & Foundry Co., are helping to solve the housing problem by the erection of homes for their employees, the former building single houses and apartments, and the latter double houses and apartments. The building work, either already completed or well under way by these two companies will provide good permanent homes for close to 1000 families. Both companies have erected large extensions to their plants to take care of Government work. The third company, the Erie Forge Co., which is building a separate plant under the name of the Erie Forge & Steel Co., has acquired a 200-acre site on which it plans to build homes for its workmen.

HOUSING AT ERIE, FOR THE GENERAL ELECTRIC PLANT



At the Left: Lawrence type of five-room and bath apartment building

At the Right: Lawrence Club for temporary accommodations of married employees

Below: Three of six dormitories erected from Government designs





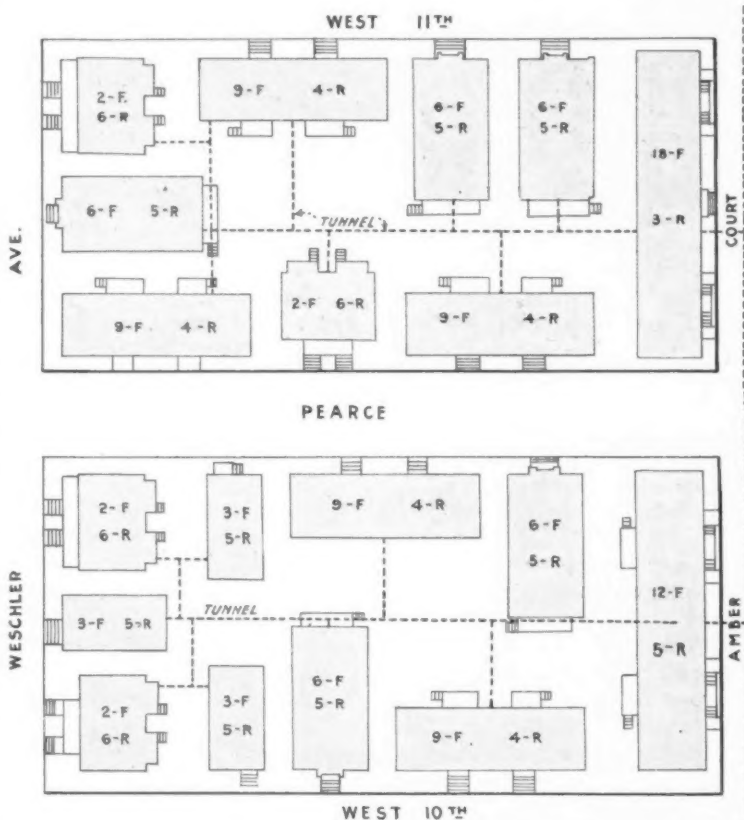
Houses Along West Eleventh Street from Amber Court to Weschler Avenue and Along the Latter to Pearce Park. (See plan below)

In addition to these housing projects the manufacturers and other leading citizens of Erie, inspired by patriotic motives and a desire to help their city, have through a housing committee composed of leading citizens laid plans for the building of 1000 homes, with the financial assistance of the Government. This project is now awaiting final action by Congress on the bill appropriating Government funds for building homes for industrial workers. Under the plan a company to be known as the Liberty Homes Co., will be incorporated with a capital stock of \$3,500,000, 80 per cent of which is to be loaned by the Government. The housing committee has raised an excess of \$700,000 in subscriptions to the stock from Erie manufacturing companies and other industries and individuals. Stockholders in this company are to be limited to a return of 6 per cent on their investment. The Government is deeply interested in the housing problem in Erie, as the bulk of Erie manufacturers in addition to the three referred to above, are largely engaged on Government work. It is stated that 78 per cent of the work now being done by Erie manufacturers is direct Government work, and that 94 per cent of it is either work that is being done directly or indirectly for the Government or in the manufacture of essentials.

The General Electric Development

The housing problem has been taken up by the General Electric Co. in Erie on a very extensive scale. The company is not building homes for its workmen to meet only present exigencies of the war, but it is looking to the future. It expects its plant to continue to grow, and its aim is to provide permanent homes for its employees at rents they

can afford to pay. Its employees will not be urged to buy homes, and in fact the greater part of its construction program is in apartments rather



HOUSING DEVELOPMENT AT ERIE, PA., FOR THE

The Number of Families and the Number of Rooms per Family Are piping from the power plant of the works, with covered pipe trenches

than single houses. However they will be afforded opportunities to buy homes if they desire to do so. The company has already spent about \$950,000 on



Houses Along Pearce Park from the Drive Toward Weschler Avenue and on Amber Court (Block



Houses Along Weschler Avenue from West Eleventh Street to West Tenth Street and Along the Latter. (See plan on facing page below)

buildings both completed and under contract.

The company's residential district is of 120 acres in extent, east of its works, about eight minutes

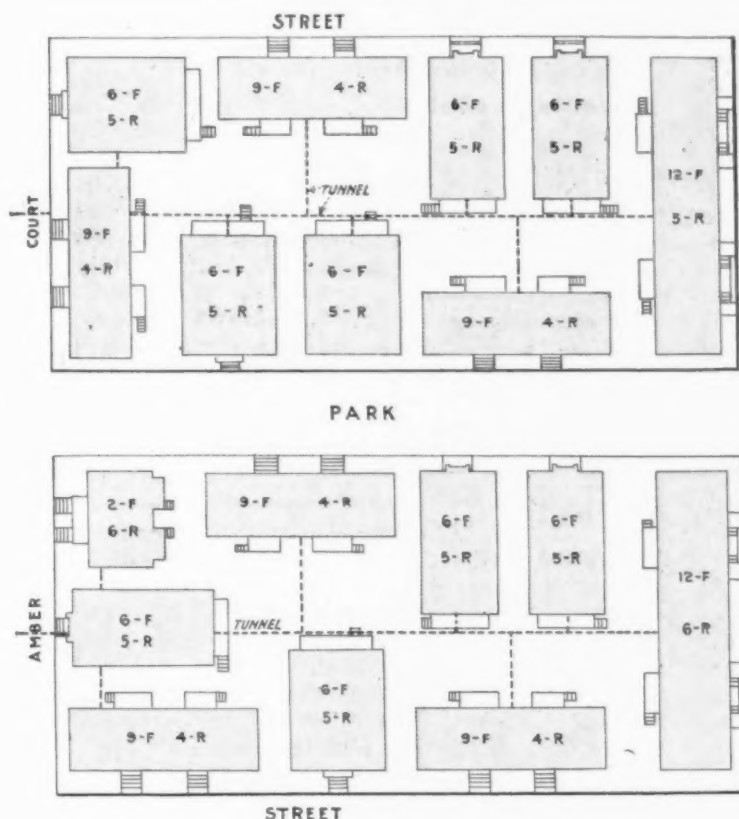
business purposes. This district is convenient to the street cars which reach the downtown section.

The park is laid out with streets at right angular arrangement. The main streets are 80 and 100 ft. wide, and the other streets 50 and 60 ft. These are to be paved and the necessary street improvements provided. Eight acres will be used for park purposes, and a strip $\frac{1}{2}$ mile long along a ravine comprising about 16 acres will also be used as a park.

The Lawrence Park development includes homes for 650 families. These will be provided in 180 five and seven-room frame houses, and 74 row type of two-story apartments with accommodations for 470 families. The houses were recently completed, and the most of them have been sold to employees on easy payments at prices ranging from \$3,300 to \$3,500. The apartment buildings will have from two to twelve suites. The eight-apartment building predominates, and there are 35 of this size. There will be 18 buildings with only two apartments, 9 with six apartments, 7 with ten apartments, 2 with four apartments, and 1 with twelve apartments.

Three types of apartment buildings are being constructed. Forty-three will have apartments known as the Lawrence type, and providing homes for 314 families. These have five rooms and a bath—a living room, dining room and kitchen on the first floor, and two bedrooms and bathroom on the second floor. Each has a front and rear porch. The illustration of this house shows the general design, and the type of the roof and front porch, the entrance being at the side of the porch. Thirteen of

the buildings will have apartments known as the Niagara type, affording homes for 120 families. These have four rooms and a bath, the kitchen and



AMERICAN BRAKE SHOE & FOUNDRY CO.

Given for Each Building. Heating is supplied through underground within each block area rather than in the streets

walk from its plant. It is known as Lawrence Park, virtually a town by itself with its own schools and stores. Part of one street being reserved for



Bounded by West Eleventh, Amber Court, Pearce Park and the Drive Not Yet Built)



Living Room in Lawrence Club

diningroom being combined. The arrangement of the upper floor is generally similar to that of the Lawrence type. Front verandas and rear porches are provided. Eighteen of the houses will each have two apartments, one on each side. These will have six rooms and a bath, and a porch across the front. The width of the different types of apartments ranges from 16 to 20 ft. Each has its own cellar, warm-air furnace and electric lights. The six-room apartments have large fire-places in the living rooms. Roomy third floor attics are provided. The rents will range from \$16 to \$18 per month for the four-room apartments and \$22 to \$24 for six rooms.

The houses are built of hollow tile and brick, and have fireproof walls and asbestos shingle roofs. To provide a pleasing architectural effect there are various modifications in the exterior designs, and brick of different types and colors are used for outer walls. Dormer windows in the roof add to the attractive appearance.

A unique and interesting feature of the development is the Lawrence Club, which is centrally located. It was built to provide temporary accommodations for married men who come to the plant from other cities. The company is thus able to make definite promises that it will have awaiting for them a good living and boarding place at a stated reasonable price. Residence in the club is limited to three months, and both the company and the new employee can learn in that time if the man is fitted for the work and the employee can decide whether he wants to stay at the plant and make Erie his permanent home. It is expected that if the man wishes to become a permanent employee, he will bring his family to Erie and will secure quarters in one of the company's apartments, which are being completed at the rate of about 20 per week, or that he will make arrangements for a home for his family in some other part of the city.

The Lawrence Club has a large living room 28 ft. square, and a dining room on the first floor and shower baths, barber shop and room for billiard tables in the basement. Current magazines are provided in the living room. Accommodations are furnished on the first and second floors for 50 men in individual rooms 8 x 12 ft. in size, equipped with \$40 worth of furniture, including a brass bed, table, dresser and two chairs. The entire building is steam-heated and attendants are provided for taking care of the rooms. For accommodations in the

Lawrence Club the men pay \$3 per week for their rooms, and \$4.50 per week for their board of two meals per day, the noon-day lunch being obtainable at the plant restaurants.

In addition to Lawrence Park the company is completing another building development on the opposite or west side of its plant, known as Franklin Park, which will provide accommodations for 100 families. In this there are 10 two-family houses and 10 eight-family two-story apartments built in blocks. These houses are of brick and for four rooms and a bath, the rent is \$15 and \$16.

As a part of the housing program there are being erected adjoining Franklin Park six dormitories designed under Government auspices. Between the dormitories a common mess hall is being built. These dormitories are for temporary purposes during the period of the war. They are two-story frame buildings, and each has forty-six single rooms approximately 7½ x 11 ft. in size. The dormitories have toilet facilities, including general washrooms and shower baths, on each floor. The mess hall will have a dining room 40 x 70 ft., a kitchen 40 x 30 ft., and wide porches on the three sides of the building.

Brake Shoe & Foundry Development

The American Brake Shoe & Foundry Co. has under construction, a large part about ready for occupancy, semi-detached or double houses and apartment houses to accommodate 298 families. The rapidity of construction is indicated by the fact that the building work was not started until late in January, and this was interfered with by the unusually severe winter. In addition to this building program the company, to take care of the urgent needs for accommodations, recently purchased one hotel building and leased another, these having accommodations for 200 men.

As a building site for its residential development the company acquired a 5-acre site that had been used as a baseball park, and only 400 ft. from the plant, together with adjoining property comprising about 1 acre of land. Its houses and apartments are located on West Tenth Street and Weschler Avenue, the former having a double-track street car line, and the latter being a 100-ft. boulevard. They are close to schools and churches and easily accessible by street cars to the business center of the city. The larger, or 5-acre tract, is 330x660 ft., and has been sub-divided into four blocks of equal size by two courts that parallel the main streets. The erection of homes for nearly 300 workmen on this limited site represents an intensified form of residence construction, and it has been the aim of the builders to compensate for the disadvantages of lack of ground space by using the space to the best advantage in designing the building, eliminating waste space and providing various conveniences for the tenants, these being equal to those found in many high-grade apartments. The buildings are artistic without being extravagant in design, and though close together have been laid out to avoid a congested appearance.

The entire development includes 41 buildings. Of these there are 5 two-story double houses with apartments for a family on each side, and the remainder are three-story apartments. There are 15 six-family, and 3 three-family, 11 nine-family, 6 twelve-family, and 1 eighteen-family apartments. The houses have six rooms and bath, and apartments three, four, five and six rooms and bath. The four and five-room apartments appear to be in the greatest demand.

The houses and apartments are all of brick of

semi-fireproof construction. For the exterior rough texture face brick and Penntex wire cut channel tile of face brick size are used. Various modifications of the exterior design have been made in the elevations, tile and color of brick, method of laying, etc., to avoid monotony in general appearance. These variations have been applied so that a person standing at one point cannot see two houses or apartments that are exactly alike. The three, four and five-room apartments are flexible in that they have one large room averaging about 15x15 ft., which can be used if desired both for a living room and dining room in order to provide an extra bedroom.

The houses and apartments are furnished with steam heat and hot water for domestic purposes, from a central heating plant. Every bedroom has a clothes closet, and each house and apartment a linen closet. A complete laundry is provided in the basement of each building, and each apartment has a kitchen range. Moderate rental charges will be made, these ranging from \$21.50 per month for the small apartments up to \$40 for the six-room houses and apartments. This includes heat and janitor service.

This building development is in charge of Harper & Russell, real estate managers of the American Brake Shoe & Foundry Co., in Erie. James Stewart & Co., Inc., New York, is erecting the buildings.

The Government Development

The Liberty Homes Co., which plans to build 1000 homes in Erie, provided the Government finances the undertaking with a loan of \$2,800,000 has back of it some of the leading business interests and various public spirited citizens who have subscribed to the capital stock of the company in sums ranging from \$50,000 down. This project was inaugurated at the suggestion of Philip Hiss, of the housing division of the Council of National Defense. Options have been secured on adequate building sites, it being the intention to build the homes on three conveniently situated tracts located in widely separate sections in the outskirts of the city. The manufacturing industries in Erie are somewhat widely scattered, and the building of these proposed homes in the different sections will be to the more general advantage of all the manufacturers than will be the case were the building operations confined to one section. Further progress in this project cannot be made until the proposed Government appropriation is available, and at present the matter is in the hands of a housing committee composed of about fifteen citizens including J. W. Sherwin, attorney, chairman; Matthew Griswold, Jr., works manager of the General Electric Co.; D. G. Hitchcock, president of the Erie Manufacturers' Association; P. D. Wright and R. P. Wright, of the Read Mfg. Co.; William Hamilton, of the Erie Car Works, and E. H. Mack, president of the Erie Board of Commerce.

Details for the houses have not been worked out, but it is the general plan to build permanent single frame houses to cost \$2,700 to \$3,200, which will be sold to the plant employees under liberal terms of payment so that it will be easy for a workman to own his own home. Under the terms of the agreement between the housing committee and the Government, the houses are to be erected upon plans mutually satisfactory to both, and the Government is to be given a blanket mortgage on the property bearing 4 per cent interest covering the \$2,800,000 it is to advance, the principal to be paid in fifteen years. When a house is sold a release from the lien is to be furnished on individual lots so that the purchaser will have clear title to the property. The



Dining Room in Lawrence Club

rate of interest charged to the ultimate purchaser is to be limited to 6 per cent, and the dividends to the stockholders are to be limited to the same amount.

Shipbuilding Plants Merged

SEATTLE, May 27.—The purchase of the Seattle Construction & Dry Dock Co. shipbuilding plant in Seattle, and the leasing of the plant to the Skinner & Eddy Corporation consummated the most important industrial deal in the history of the Pacific Coast, and probably means more to the industrial welfare of Seattle than any other single development in the history of the city. The merger will be completed on June 1, and will give the Skinner & Eddy Corporation, under the new organization, a total of 12,000 men employees. David Rodgers, general manager of the Skinner & Eddy Corporation, will direct the operations of the merged plant.

Following the announcement of the merger was the placing of an order by the Emergency Fleet Corporation with the Skinner & Eddy Corporation for \$100,000,000 worth of steel ships, insuring to the Seattle plant continuous operations for more than two years.

The two plants adjoin each other near the entrance of the East Waterway. Each has a site of 27½ acres. It is understood that the Skinner & Eddy Corporation plans extensive improvements to the merged plants, although officials of the company have not authorized this statement.

The Seattle Construction & Dry Dock Company, which is owned by the Todd interests of New York, retains its ship repair plant, which it is planned to move to the company's shipbuilding plant in Tacoma, known as the Todd Shipyards. The ship contracts held by the Seattle Construction Co., including those for the battle cruisers and torpedo boats for the Government, will be transferred to the Tacoma plant, with the exception of the four 7500-ton ships now on the ways, which will be completed under the new regime.

The Skinner & Eddy plant was founded in 1916. Since the first of the present year, the corporation has built eight 8800-ton steel steamships, and has a record for breaking world records for speed in big steel ship construction, including the world's record steamship, *West Lianga*, which was launched in 55 days, commissioned in 67 days and at sea 72 days from the date of her keel laying.

The Skinner & Eddy plant now has 15 direct-contract 8800-ton steel steamships to build for the Emergency Fleet Corporation. The Seattle Construction plant has direct contracts for 10 7500-ton steel vessels. The total shipbuilding contracts now held by Seattle firms reaches more than \$250,000,000.

Export Problems in the Machinery Trade*

Possibilities of European Competition When Peace Comes—Leaves from the Book of a Cincinnati Exporter

—BY ROBERT S. ALTER†—

AS we are aware, those countries which constitute not only our Allies but the enemy countries as well have a degree of governmental assistance and support to their commercial activities that we Americans in the past have not enjoyed. That this support is an absolute necessity for the future commercial welfare of our country is self-evident.

While we have a Department of Commerce which is making an honest effort to render service to American manufacturers in exporting their wares throughout the world, yet it is significant that to date there is not a single special organization to enter upon this work. Consequently, there is no agency to pool the findings of such an organization, which consolidated would give to us suggestions as to what policies to adopt in dealing with the peculiar competition we shall have to face.

To Make Implements Instead of Guns

Many large plants now confined to the production of war material will be utilized for other purposes when peace comes. According to a recent consular report, the Skoda gun plant, of Pilsen, Bohemia, expects to control the farm implement trade in Russia and the Balkans after the war, and has already made preparations for the conversion of its gun-making plant as soon as peace is declared. The report states that plants connected with the Skoda works already have quantities of machines which are to be shipped into Russia as soon as the border is opened.

It appears also that the Skoda works are counting on the neutralization of the Dardanelles and a resulting increase of traffic on the Danube, which has caused them to prepare to build motor boats for export to Turkey and Bulgaria. One part of the plant is to be converted into an automobile and aeroplane factory, while another part will continue in the manufacture of war materials. I have visited this enormous plant on several occasions, and can realize fully what it can accomplish in competing with the sales organizations of other countries in the territories mentioned.

The debts of our Allies at the end of this year will be colossal. It is estimated that Great Britain's national debt at that time will be \$50,000,000,000, or practically one-half of the nation's wealth. Great Britain is not crushed under the weight of this obligation. She knows exactly what she is going to do to pay it. Great Britain has already taken steps to carry out extensive developments in her various colonies. Development possibilities in Canada alone are so enormous that legislation has recently been passed whereby Chinamen will be allowed to emigrate and will be employed in building railroads, cultivating the soil, and other capacities, at the insignificant wage rate of 62½c. per day. This shows exactly what Great Britain intends to do in the way of future development.

American Advantages

Similar plans are under consideration with other countries and their colonies. Some are also planning the development of the vast agricultural and mineral possibilities of South America. However, we should not be alarmed over the possibility of this extensive program working against us, provided we are willing to lend ourselves to the general scheme. It might be advantageous for us to co-operate in giving financial assistance to the work of reorganizing those countries which have been "hard hit" by the present conflict,

thereby gaining their support in trade on a reciprocity basis. America is in an excellent position to render this assistance, on account of the huge gold reserve which we have accumulated. This gold reserve will be immediately available upon the cessation of hostilities and will give America the first opportunity to reap the benefits derived from this source. The extension of the American banking system, which is rapidly taking place, will offer great help in guiding and assisting credit extensions to countries needing credit.

If the Allies can hold together after this war, the combination will form an organization consisting of practically three-fifths of the land of the world, three-fifths of the population and mineral resources, and a string of colonies extending around the world. With such co-operation, German interests will find a worthy competitor.

The trade situation with neutral countries after the war will be quite unique, according to information I have collected on this subject. The export restrictions against them have made it difficult for the neutrals to import the articles they formerly secured from abroad. This has forced them to cultivate their own fields to obtain food, and to develop their own mineral resources to secure necessary raw materials for home requirements, as well as war orders, the latter being quite profitable.

This industrial development has increased the number and size of manufacturing establishments to a remarkable degree. When the war is over, they will be better able to take care of themselves than formerly, independent of outside assistance, and besides, a market must be found by them for the over-production. Neutrals, therefore, are looking more than ever to export possibilities for their own commodities, and are coming to a broader understanding of their own capabilities toward self-preservation and securing world trade.

Competition from Scandinavia

Let us take the Scandinavian countries as an example. These countries, in the past, have been large importers of all kinds of material, particularly manufactured products. Denmark, Norway and Sweden have recently invested one billion kroner (\$270,000,000) in factories which will directly compete with American firms, not only in their own countries but in the world at large. These factories are manufacturing chiefly such goods as emery wheels, twist drills, taps, dies, engine lathes, planers, shapers, chucks, files, hammers, axes, shovels, ball-bearings, railroad supplies, wood-working machinery, automobiles, harvesting machinery, shoe machinery, lumber machinery, and many other classes of commodities.

The raw material for the manufacturing of these products is obtained very largely from Sweden and Norway, and the production of these industries is arriving at such a high degree of efficiency that they can more than supply the home consumption. An investigation of the conditions in these countries would lead to the belief that after the war the prices will be considerably lower than those prevailing at present, not only on account of the reduction in the cost of raw material, but on account of constantly increasing efficiency of manufacturing organizations.

For this reason, they are fully expecting to compete in a most energetic and intelligent way against American and European firms, who will feel their competition in Russia and Asia, as well as the greater part of Europe. In addition, the Scandinavian countries have the advantage of being closer to the majority of

*From a paper read at the National Foreign Trade Convention, Cincinnati, April 19, 1918.

†American Tool Works Co., Cincinnati.

these markets than the American firms. The embargo against Scandinavian countries, while admittedly a war necessity, has nevertheless developed in those countries a new and determined competitor in foreign fields.

Scandinavian customers had a leaning toward American products, and it is regrettable that war conditions have forced us to curtail shipments to them. Tonnage has been available, because the Scandinavian countries are employing a considerable part of their large merchant marine for the war requirements of America and her Allies, a certain amount of this tonnage being used for traffic between this country and theirs.

In recent months several boats have left for Scandinavian ports with passengers, but practically empty as far as cargo is concerned, although goods for Scandinavian countries have filled certain New York warehouses. I have advice that a large Danish steamer will be allowed to sail shortly for Denmark with passengers, but otherwise practically empty. It is certainly unfortunate that the various associations in Denmark, Sweden and Norway have not been able to satisfy our Government that American goods imported into those countries would not be re-exported to the enemy, as otherwise our products would have been established in these countries to a degree difficult to enjoy at any other time.

German activities in these countries are bound to militate against us under these circumstances, and the development of home industries there is creating a condition which, unless very energetic steps are taken to retain our trade, will result in making Scandinavia a competitor for our goods where we formerly had a customer.

Maxims for Exporters

The uncertainty as to the volume of business we will secure from Europe after the war brings up the old axiom, "Don't put all your eggs in one basket." The logical thing to do is to go after new markets without the least delay. Now is the time to start work in virgin fields, as it takes time for the seed to grow and still longer to reap the harvest. The crop from the fields which we have cultivated for years may not now yield its utmost, and the safety of our export business—in fact, the safety to the proper balance of our individual businesses—may depend upon orders secured from new markets.

The exporter must, first of all, consider the market in question from the standpoint of its buying ability for his particular commodity. Much money is wasted every year, and export campaigns do not bring fruit simply because the firms behind them neglect to study the markets.

The matter of climate and altitude should not be overlooked. For example, there is a good market for heavy overcoats in Mexico City, because of its altitude, regardless of the fact that it is far south of us. Many centers of population in tropical countries are situated in altitudes which give them temperate atmospheric conditions.

The occupation of the people will indicate the needs of the community for raw material, machinery, tools, clothing, luxuries, etc., the latter depending greatly upon the degree of refinement of the population. Naturally, those people who can be compared with us in civilization, regardless of their geographical location, will be interested in buying commodities which we ourselves use and enjoy, such as automobiles, victrolas, pianolas, motor boats, photographic apparatus, etc.

On the other hand, the peoples in savage and semi-savage countries may use cheap cotton cloth and a few simple utensils, but would hardly create a market for laundry machinery, much as they might need it.

Knowledge of these conditions, based on study and observation, is necessary to determine whether there is a market for a product. It is an interesting and fascinating study and well worth the time of any business man who desires to expand the horizon of his orders.

Commercial Laws and Customs

Moreover, in going into new markets, it is well to familiarize one's self as far as possible with the com-

mercial laws effective in those countries. Because we have certain laws for doing business in our country is no indication that the same applies everywhere. While the laws in approximately fifty independent foreign countries may differ (not to mention the colonies which may come under their jurisdiction, having their own local regulations), and while, at a glance, the complexity of this subject might appear discouraging, yet it is not hopeless.

Commercial law governing foreign transactions shows a degree of uniformity in fundamental principles throughout the world. Then again, there is a certain amount of confidence and business honor existent, when one's negotiations are carried on with reputable people, regardless of where they are located. A firm wishing to maintain its reputation and credit will find it obligatory to follow established business practices, rather than stoop to acts of cupidity. Commercial law has been largely built up by a long line of precedents established by merchants in dealing with each other.

There are two distinct legal groups involving civilized nations. The first includes the United States, England and some of her colonies, whose law has not been reduced to fundamental codes, coming under the head of "common law," based on decisions of the courts and precedents. The second group includes practically all other nations and is using what is called "civil law," which is closely related to the old Roman law. The underlying principles are frequently embodied in the form of written codes. What interests us most in these countries is the section covering commercial codes, which makes quite a distinction between traders and commercial transactions, and non-traders and non-commercial transactions.

Therefore, in drawing up agency contracts, in shipping goods on limited or indefinite consignment, in allowing expenditures to be made for propaganda, and in dealing with trademark and patent matters, in sending salesmen to work independently of any established agencies and in extending credits, it is advisable to become familiar with the legal points covering each in the countries concerned.

I take this occasion to speak a word of caution about the use of the word "agent" in drawing up various documents, as I have known cases where the use of this word by the manufacturer has placed him in a very embarrassing position when called upon to meet certain expenses charged to him by the person appointed as a sales agent.

Competitive Prices

The matter of regulating the selling price of your products in foreign countries deserves the most profound consideration. The fact must not be overlooked that the foreign salesman or dealer is in a large percentage of the cases up against more competition than would be the case here in America.

Almost everything that America can supply can also be furnished by Europe, and therefore in getting down to the final stages of a foreign deal it is common experience to find that you are not only enjoying the competition of your American friends in your same line of business, but also the European manufacturers in the same class.

It is obvious, in view of the additional cost of transportation, duties, etc., on shipments from America, that foreign dealers, thinking only of their own pocket-books, might easily and willfully quote prohibitive prices on American products in order to sidetrack them, and thereby be able to handle a similar article of European production on a much more profitable basis by bringing the price up sufficiently under the American to secure the business. This increase in price and the low cost of delivery of the European article would naturally make his margin of profit most acceptable. It therefore behooves us all to give this matter special attention, and the best place to secure the data is on the ground.

If you want foreign business, go after it in person. Take the time. Become personally familiar with the markets and the agents who are handling your interests. How can any dealer enthuse over principals whom he has never met, and with whom he has never

had the slightest degree of social intercourse? Insurance agents write millions of dollars' worth of insurance on the strength of their personal acquaintance, often on an unequal basis with their competitors, but the personal contact and bonds of friendship get them the business. The same applies to the development of foreign trade from the standpoint of the individual firm which is expanding into this field.

Preparation for Peace-Time Trade

We should not allow apparent difficulties to dampen the ardor of our activities, because we have before us examples of the wonderful success in export trade enjoyed by countries which we can now more easily call our neighbors than ever. If their brains have enabled them to amass huge fortunes from this class of trade, it would be an insult to the intelligence of American business men were it to be intimated that we are not at least the equal of these neighbors.

That the British manufacturers are afraid of our competition after the war is clearly set forth in a speech made by J. Judson on March 8 last before the machine tool builders of England. Mr. Judson says in part:

We are all out to win the war, but there is another war to come, viz., the commercial war, and I am sure that we cannot tackle the problem properly unless something is done to assist us against both American competition and probably German competition. It is going to be difficult for the British machine tool makers to compete in the world's markets, owing to the fact that our American rivals have amassed huge reserves during the war period, which reserves will enable them to travel and advertise and do everything possible to secure the trade.

He then goes on to give data on comparative prices of American and British machinery, and continues:

It just shows us the surplus our friends will have to work with, enabling them to secure a maximum share of the world's trade. Our aim should be to see Great Britain self-contained in this industry. There must be no "next time" of going thousands of miles for such essential commodities as machine tools and accessories which are the absolute basis of every article for defense, offense and peace-time necessities.

In Belgium there has been instituted a Comptoir National pour la Reprise de L'Activite Economique en Belgique, which intends not only to back Belgium firms in advancing the necessary money for purchasing the re-equipment of their plants, but at the same time to carry a large stock of material and to place orders as soon as circumstances permit. This company has been definitely formed and is backed by the government. It is intimated that before long manufacturers in the United States will hear from it as to its methods of purchasing and acquiring material.

In Scandinavian countries there is still hope, as evidenced by a letter which I have just received from Stockholm, which states that many of the reputable dealers who have been handling American goods have been almost shut down from inability to receive material. However, in the face of this they have tried to keep loyal to their American connections by not entering into promiscuous dealing with inferior goods as a substitute. In adopting this policy the author of this letter, who is a personal friend of the writer, states that these dealers have allowed opportunities for making a lot of money to pass. They prefer, he says, to continue to wait until they are able to renew their relations with their American manufacturers of first-class articles, claiming that they built up sufficient reserves in the past, through these connections, to tide them over until the time when they can resume their work in the usual way.

This evidence of loyalty is worthy of our most profound respect, and should give us the incentive to be absolutely fair, square and lenient with these connections when they are again established.

The National Safety Council will hold its annual meeting on Oct. 14 to 18, inclusive, at the Hotel Statler, St. Louis. Safety exhibits will be provided, as usual. W. H. Cameron, general manager of the council, reports 141 new memberships in March and 125 in April.

Low Manganese, High Phosphorus Spiegeleisen from Slags

A process for the manufacture of spiegeleisen, based on the recovery of manganese in the slag or flush cinder produced from open-hearth furnaces when making steel, is covered by a patent (U. S. 1,261,907—April 9, 1918) granted to Albert L. Cromlish, Sharon, Pa.

"Flush" cinder and "tapping" cinder are waste products formed in making open-hearth steel and produced in large quantities, the flush cinder being obtained when using the well-known pig and ore processes of which the Monell process is one. The flush cinder and also the tapping cinder contains large amounts of manganese as oxide of manganese. An average analysis of flush cinder is:

	Per Cent		Per Cent
Manganese	10.25	Alumina	3.30
Iron (by difference)...	37.88	Lime	17.75
Phosphorus	0.77	Magnesia	7.45
Silica	22.50	Sulphur	0.10

The tapping cinder used in forming the burden has a composition averaging about as follows:

	Per Cent		Per Cent
Silica	36.67	Magnesia	16.01
Alumina	7.43	Manganese	5.00
Lime	33.39	Sulphur	1.50

One object of the invention is the production of a low manganese spiegel that is adapted for many uses and particularly in making special steels, as, for example, a steel intended for rolling into sheets, black plate, and tin plate. The flush cinder is smelted or reduced in the blast furnace. The burden is reduced in the same manner as when manganese ores are employed in making ferromanganese and spiegeleisen, the furnace being tapped at stated intervals and the molten spiegel being cast into pigs in the usual manner or, when desired, being used in a molten condition. Approximately 85 per cent of the manganese in the flush cinder and tapping cinder is claimed recovered as spiegel. The resulting product is a low manganese spiegel, a typical analysis of which is:

	Per Cent		Per Cent
Iron (by difference)...	77.18	Phosphorus	3.00
Manganese	13.80	Silicon	1.00
Carbon	5.00	Sulphur	0.02

When using nothing but cinder in the furnace burden the composition of the spiegel made will vary within the following proportions:

	Per Cent
Iron	25.00 to 65.00
Manganese	13.00 to 25.00
Carbon	4.50 to 6.00
Phosphorus	2.20 to 3.40
Silicon	up to 1.00
Sulphur	up to 0.02

The manganese in flush and tapping cinder, two hitherto waste products, is reclaimed, according to the patentee's claims, and a low manganese, high phosphorus spiegel forming an alloy which is peculiarly adapted for use in the manufacture of steel in making sheets and tin plate, is obtained. The production of a spiegel of the composition claimed provides a cheap substitute for ferromanganese or spiegel, and ferrophosphorus or high phosphorus pig iron, and similar expensive materials heretofore necessary in making sheet and tin bar.

The American International Shipbuilding Corporation's address is now Hog Island, Pa. The corporation states it is very important that this address be used, as the Emergency Fleet Corporation has moved into the building in Philadelphia, where the American International Shipbuilding Corporation was formerly located, and unless the Hog Island, Pa., address is used there is likely to be much confusion in handling correspondence.

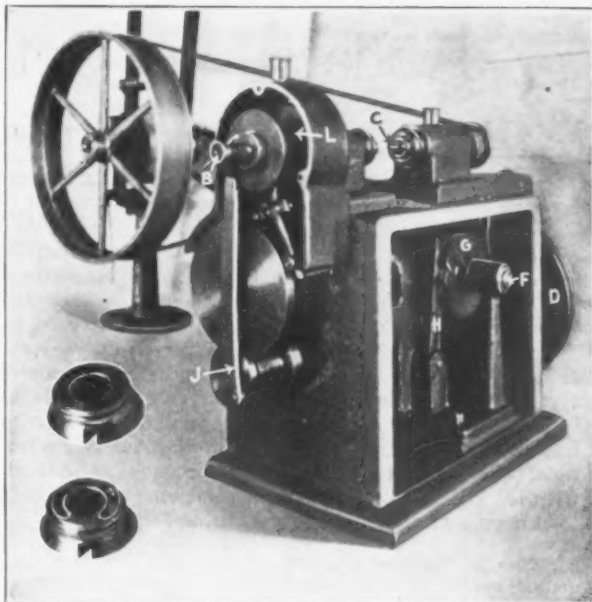
The Eastern Flexible Conduit Co., 594 Johnson Avenue, Brooklyn, N. Y., has changed its name to the Eastern Tube & Tool Co., Inc. In addition to producing flexible conduit, loom and armored electrical cable, drill chucks and small tools will be manufactured.

Routing Machine for Powder Grooves

An automatic machine for routing the power grooves in the firing pin plugs of high-explosive shells is being built by the Automatic Engraving & Mfg. Co., 79 East 130th Street, New York, from the design of its vice-president, E. A. Lundvall. The work performed consists of the cutting of an interrupted annular groove in one end of the plug and from the time the piece is placed on the special chuck used until the two portions of the groove are completed, the machine requires no attention. This it is pointed out makes it possible for a single female operator to take care of three machines.

As will be noticed, the piece to be finished has a slot in one end and this is taken advantage of in placing the work on the special chuck at A. By turning the handle B, the piece is gripped securely by the chuck. The routing of the groove is performed by the cutter C, which has a separate drive from the countershaft and operates at a speed of from 12,000 to 20,000 r.p.m., according to the rate of output desired. This cutter is fed forward by power which is derived from the pulley D. Mounted on the shaft with this pulley is the worm E which meshes with a wormgear on the shaft F. The cam G mounted on this shaft presses against a pin on the lever H which is connected at its upper end to the cutter head. The rotation of the cam forces the cutter into the work, the exact amount of penetration being governed by the graduated knob I. When the cam has completed a revolution, the pin falls into the notch in the position shown and the cutter is retracted. To secure the desired form of groove the piece is given an oscillatory motion by an eccentric J which is driven from the pulley D.

When the groove in one half of the piece has been completed and the cutter retracted, the piece is indexed to bring the other side into position for completing the work. The indexing is accomplished by a Geneva motion which is driven from the shaft K and is kept from operating, except at the proper time, by a locking pin which is seated in one of two notches in the edge of the disk L. On the rear end of the shaft F is mounted a disk M which has a slot cut in its periphery and an interference piece mounted at an almost diametrically opposite point on the back. While the groove is being routed, the pawl connected with the lever N rides on the circumference of the disk. When the first groove is nearly completed and the cam G has rotated sufficiently to bring the edge of the slot opposite the pin on the lever H, the lever O strikes the interference piece on the disk M. This unlocks the indexing mechanism and when the disk M has turned a trifle further the pawl connected with the lever N engages with the slot in the periphery of the disk. This engages the toothed clutch P and forces the gear R to operate the indexing mechanism. As soon as the indexing operation is completed, the pawl attached to



The Cutter Spindle Is Driven at 12,000 r.p.m. by a Separate Belt and the Work Is Given an Oscillatory Motion by the Eccentric at the End

the lever N is withdrawn from the slot in the disk M, and the lever O is released from the interference piece and forces the locking pin home in the other slot in the disk L. This is accomplished while the pin on the lever H is traveling from one end of the irregular slot in the cam G to the other, and as soon as the curved portion of the cam surface bears against the pin the cutter is again fed forward and the piece is oscillated through the action of the eccentric J. Upon the completion of a second revolution of the shaft F with its attached cam G and disk M, the gear R operates to throw out the starting lever S and stop the machine.

As soon as the finished piece is removed and another one inserted at A, the starting lever S is raised by the operator, thus starting the machine on another cycle.

Dominion Steel Corporation's Production

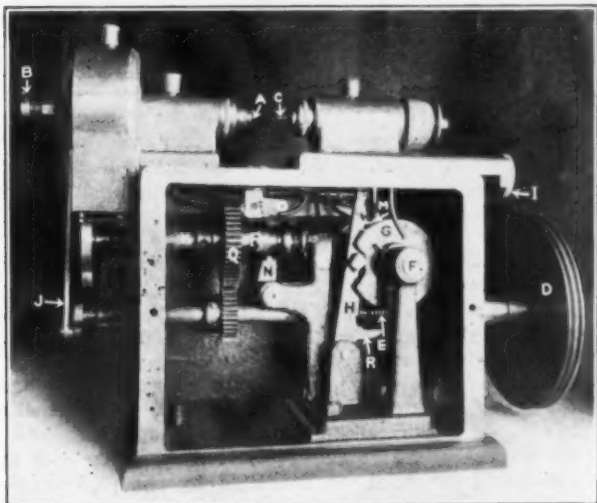
The production of the Dominion Steel Corporation, Sydney, N. S., for the month of April, as compared with that of March last, is as follows:

	April Tons	March Tons
Pig iron	28,000	25,000
Ingots	31,000	30,000
Billets	12,000	24,000
Rails	13,000
Rods	7,200	9,600
Merchant bars	1,200	4,200
Wire and wire products.....	2,300	2,300
Coal	200,000	290,000

The No. 3 blast furnace of the Carnegie Steel Co., at Farrell, Pa., will be blown out in a short time, and rebuilt. The new stack will have a capacity of 500 to 550 tons per day. It is also likely that No. 2 stack at Farrell will be rebuilt later to make it the same size as No. 1 stack. At the Farrell blast furnace plant, work on new ore bins, ore bridges and car dump is being pushed, the American Bridge Co. doing all the steel work.

At the annual meeting of the Kelly-Springfield Motor Truck Co., Springfield, Ohio, the following officers were elected to serve during the ensuing year: President, James L. Geddis; vice-president and general manager, C. F. Gardner; secretary, P. H. Diehl, and treasurer, P. W. Maguire.

The firm name of Watson Brothers, New Castle, Pa., jobbers in sheet and other products, has been changed to the Watson Brothers Steel Co.



The Powder Grooves in the Firing Pin Plugs of High Explosive Shells Are Routed in an Automatic Machine Operating at High Speed

Jobbers Will Get Shipments of Steel

American Iron, Steel and Heavy Hardware Association Receives Assurances, but Material Must Be Exclusively Used for War Essentials

JOBBERs in iron and steel will receive shipments from mills and priority certificates will be furnished to them by the Priority Committee of the War Industries Board when it can positively be shown that the material is for work essential to the prosecution of the war or to replace iron or steel which has been sold to war plants. This information was made known at the annual convention of the American Iron, Steel and Heavy Hardware Association at Atlantic City, N. J., last week. The association made a pledge to conserve steel for war purposes as follows:

Whereas, we, the members of the American Iron, Steel and Heavy Hardware Association, in convention assembled at Atlantic City, May 23, 1918, realizing the seriousness of the steel situation and fully conscious of the importance of warehouse steel distribution in supplementing mill supply, resolved, that we do hereby pledge ourselves individually and for our companies during the duration of the war to sell our steel, first, for the requirements direct and indirect of the United States Government and, second, for such essential uses as may be directed by the Priority Committee of the War Industries Board.

E. A. S. Clarke, president Lackawanna Steel Co., and secretary of the Committee on Steel and Steel Products of the American Iron and Steel Institute, was expected as a speaker at the convention, but wired his regrets, and assured the jobbers that their wants would be taken care of so far as possible. His message to Secretary A. H. Chamberlain read:

I greatly regret that the pressure of my committee work prevents my being present to address your convention. Will you be good enough to say to the convention that our committee greatly appreciates the fine spirit of co-operation in which your association has worked with us in the observance of the prices fixed by the Government and those recommended by the Institute. Please say to them also that our committee recognizes that the iron and steel jobbers occupy a useful field and that it will be our pleasure to use our efforts to see that the warehouse men and jobbers of the country receive their fair proportion of steel products based on the war business that they do.

The news that jobbers would be provided with steel was received with delight by the members of the association, many of whom had begun to fear that the requirements of the Government and the 100 per cent pledge of the steel mills would render it almost impossible for jobbers to obtain stocks.

A Difficult Undertaking

L. P. Ordway, of Crane & Ordway, St. Paul, a civilian member of the Priority Committee of the War Industries Board, told the convention that it had been difficult to convince the representatives of the Army and Navy on the committee of the importance of jobbers getting stocks for indirect Government work, but that finally the point had been won. The jobber, however, must have the assistance of the Priority Committee to get material and Mr. Ordway made it plain that any attempts on the part of jobbers to obtain steel for other than essential needs would seriously injure them in the eyes of the Government officials.

"Don't ask for priority unless you need it," said Mr. Ordway to the jobbers. "Try to get the people in your community to refrain from using any steel not for war needs. If a factory wants to put up even a small addition, be sure that the factory is working on Government material. Do not apply for any material unless you actually need it for war work. Don't apply for twice as much as you need, hoping that you may get half of what you ask for. And give all the details. If you deal frankly with the committee we will give every consideration to your applications for priority."

Mr. Ordway said he believed there was going to be

enough steel for all essential requirements, despite the present stringency.

An interesting report on the steel situation as it affects the jobbers was read by S. L. Orr, Evansville, Ind., chairman of the War Service Committee of the association.

Troublesome Problem of Extras

Mr. Orr told of the aims and purposes of the war service committee of the association. He said it had first recommended to members that they strictly adhere to the fixed resale warehouse extras, though certain classes of small trade may continue to carry the customary differentials on account of cost of handling and extra credit risk. On all the large warehouse business, he stated, the warehousemen must patriotically accept the Government's resale prices. Mr. Orr said that the war service committee had endeavored to obtain uniformity of practice in the matter of warehouse steel extras. In some localities, he said, full extras are added, and in still other communities a so-called "warehouse extra" prevails. "Your committee," said Mr. Orr, "recommended the warehouse extras, as a compromise, but so far we have not been successful in securing their establishment. If there is any justification for the mills to charge an extra for certain sizes on account of higher cost or limited sales, these same reasons would entitle the distributor to extra profit as well. Our arguments were met with the assertion that the fixed spread of profit allowed to jobbers was purposely made larger to cover this extra and that, therefore, mill extras should be used on all larger warehouse business."

Mr. Orr told of the recent conference between jobbers and J. Leonard Replogle, director of steel supply for the War Industries Board. "We were assured without being obliged to present our brief," said Mr. Orr, "that the essential nature of our business was recognized and we would come in for our share of available steel under direction of the Priority Committee. Mr. Replogle stated that the demand for plates and large rounds for munitions was so large that he was in doubt how our present output could take care of it." Mr. Orr further quoted Mr. Replogle as saying that "unless our resources are husbanded there will be a scarcity of steel as acute as last winter's fuel shortage."

Mr. Orr advised the members that steel for private and commercial building is to be discouraged, and he added that jobbers would have to be careful that their sales for building material were for war work.

The following paragraphs from Mr. Orr's report contain the committee's advice to jobbers as to how they should govern themselves under the new conditions:

"Before applying for priority, our members must consider very carefully whether the use of the material will effectively contribute toward winning the war. Understand, we are in an acute scarcity, and we want to assist the Government to distribute the steel only to the most necessary and essential industries. There is enough Government business to be supplied—there are enough strict essentials, and it is the recommendation of this committee that you confine your applications solely to such essential purposes. We will only prejudice our case if we send in applications for priority for material which does not stand the test as printed on the rules and regulations. We are on trial, and if we do not prove to the Priority Committee that our service is essential, as indicated by the character of the purposes for which application is made, we then may be shut off entirely, and the very valuable service which we can render is going to be denied us. The Priority Committee recognizes steel which is wanted to secure production, not for merchandising, which

keeps going essential industries and products that are necessary to maintenance of same. We must conscientiously study this priority question, so as to avoid making mistakes in applying for things which are not entitled to preference. It is in the committee's opinion principally a matter of ignorance on the part of the members in not thoroughly understanding the situation. We must make it our business to conscientiously apply the priority test to our sales. Is this material necessary and essential in helping to win the war? Will the Priority Committee look at it as essential to winning the war? It is easy for us to argue ourselves, but what the war service committee wishes to impress upon you is that you must only apply for priority on material about which there is no doubt whatever. If there is any doubt in your mind, don't apply at all at present—no matter how good a customer it may be for, because it is only going to reflect back on you and may result in your being cut off where another jobber who has been careful to take business being supplied to the Government itself and other strictly essential industries, is still able to get steel because his service is going in the right direction.

"While we have no direct authority for the statement, it is the committee's belief that the acute scarcity will apply more particularly to such items as plates, large rounds, etc., which are required for shipbuilding and munitions. There is a limit to the production on any one given class of material, so that all the steel could not be used in its manufacture, and there would be tonnage available for other steel items in which the situation might not be so serious. It is our information that the Priority Committee is disposed to consider application for priority for stock and to recognize also when tonnage justifies, a Government order number for replenishment. We jobbers are in a peculiar situation, since we do not have available Government order numbers, or know accurately the ultimate uses of our steel at the time we place our order. Unless we can secure some preference, our stocks are bound to become depleted and our service impaired. In the application for priority, which must be made out on the regular blank furnished by the Priorities Division of the War Industries Board in Washington, it is necessary to state the purposes for which the material is to be sold and these must be for strictly essential uses, as laid down by them in their rules and regulations. Government work, direct and indirect, and then such essentials as transportation, mining, oil companies, agriculture, etc., applying the test as outlined by them.

The Test

In requesting priority the petitioner should join with the committee in applying the test:

To what extent, if at all, will the granting of this application contribute, directly or indirectly, toward winning the war; and if at all, how urgent is the need?

"This application must be signed by an officer of the company and not by purchasing agent, and the uses enumerated must be strictly adhered to.

"We are on our honor to loyally support the Government in its endeavor to make every pound of steel count for winning the war. You can readily see the purpose and result of this control, which places in the hands of the Priority Board the ultimate use of the whole output of steel. We must have conservation of steel just as we have conservation of food and fuel.

"Your order for material is to be sent to the mill with whom you regularly have a connection and then the priority approval, if issued by Priority Committee, we understand, is sent to that mill direct to save time. It may be that the mill will not be able to accept your order, and you will then have to try elsewhere. This priority certificate only is a recommendation that your order be accepted and does not carry preference in execution, but you are required to wait your regular turn, according to the classification given you by the Priority Committee, depending on the nature of the purpose for which it is intended. The public announcement that all steel was commandeered for Government uses only was most terrifying, but it is the opinion of your committee that this does not mean as drastic action as would be implied, except in certain lines.

Even if your orders have been refused by the mills without priority, it does not indicate that they may not be in position to take care of you with priority. To enable them to secure their full share of coke and coal to maintain full operation of their plants, the mills are anxious to have priority approval on all orders, so they can show that they are operating 100 per cent Government instructions; otherwise, they might have difficulty securing fuel, for instance, which in itself gives the Government authorities the desired control of the situation.

"It may be we will have to apply for priority on every purchase at no far distant date, but until this is required it is recommended by your committee that we use priority only when absolutely necessary to secure stock for strictly essential requirements."

Priority Problems

In response to questions directed to him after Mr. Orr's paper was read Mr. Ordway of the Priority Committee said that he thought it very probable that the committee would pass favorably upon applications for steel to replace material which jobbers could show had been sold from their stocks for war work. He was asked as to the length of time it would take for applications to be passed upon. His reply was that this would depend upon the fairness of the application. He said that jobbers must confine themselves to a merchant business. If they attempted to do a brokerage business, or, in other words, to obtain priority certificates for direct shipments, their applications might be refused.

A resolution was adopted by the association in favor of "iron-clad" contracts with manufacturers. This matter was thoroughly discussed at one of the sessions, a strong sentiment being displayed in favor of such contracts as against the option form of contract which has generally been in effect between steel mills and the jobbers. The form of contract used by the sheet makers was generally approved.

F. N. Shepherd, field manager for the Chamber of Commerce of the United States, delivered an interesting talk on the work of that organization. He said that the Chamber of Commerce is co-ordinating the industries of the United States with the needs of the Government. It brings to the attention of the proper departments in Washington the unemployed facilities of industry. A staff is maintained in Washington which will gladly co-operate with the war service committee of any association. Much good has been accomplished for the nation, Mr. Shepherd said, through the elimination of many unnecessary types and sizes of manufactured articles.

War Service Organization

Charles W. Asbury, Philadelphia, president American Hardware Manufacturers' Association, told of the work of the war service organization of that body. He said that the response of members to the calls of the Government for service have been 100 per cent. The quantities of some items of hardware wanted by the Government were appalling, he said. Many manufacturers were already overloaded with commercial business, which they promptly set aside in order to serve the Government first. Mr. Asbury related an incident which shows how the hardware manufacturers have met the Government requirements. The Germans began using a barbed wire that was harder than anything used before—so hard, in fact, that it successfully resisted cutting with the pliers then in use in the Allied armies. A meeting of American manufacturers was called and the combined experience of several of the leading makers of pliers resulted in the adoption of a wire cutter which went through the hard German wire like cheese. Mr. Asbury said that about 1000 manufacturers are co-ordinating their efforts in war service work in the organization formed by the American Hardware Manufacturers' Association. A bureau is maintained in Washington in charge of Murray Sargent, formerly of Sargent & Co., New Haven, Conn.

Other interesting features of the convention were as follows: An address on the events leading up to the war by United States Senator James E. Watson of Indiana; an address on war conditions in France as

he had seen them by Everett Colby, of the United States Food Administration; an illustrated lecture on "The Airplane in the War," by Joseph A. Steinmetz, of Philadelphia, president of the Aero Club of Pennsylvania, and discussions on trade topics such as "direct shipments," "warehouse extras," and "protection of the jobber." On the subject of direct shipments, there was unanimity of opinion against jobbers taking orders from customers for direct shipments from mills.

THE LIBERTY MOTOR TO-DAY

Over 1000 Engines Completed—Lack of Tools and Skilled Workmen Overcome

The Liberty motor is being produced in quantities, according to Charles F. Kettering, president Society of Automobile Engineers, in an address before its New York section May 20. He stated that: "The thousandth engine was shipped by the builders several days previous to that date, only two companies having been in production, one of these in production for about 60 days. The Ford Motor Co. has tested its first engine and put it through the official 50-hr. test. The same thing is true of the Cadillac Motor Car Co. and of the Buick Motor Co. The Marmon Co. is, I believe, putting its engine through the test now.

"It has not been a year since the first one of these engines was put together experimentally. It is a new product, a new order of things, which people are not familiar with. It is perhaps because we do not analyze these conditions that so much criticism and gloom have spread over the country. There is only one thing that will answer the criticisms and that is the engine itself. But I think it will be very gratifying for you to know some of the simple facts. We can show you things in Dayton that would gladden your hearts and brighten your eyes. And Dayton is only one place of activity in this matter.

The Inevitable Delays

"There is one thing we ought to get into our heads that I think we have not appreciated entirely, and that is the fact that if not a single mistake had been made in any one of the Government proceedings, we would have been delayed from three to four months in obtaining the amount of tools needed because of the congestion in transportation, in addition to the extraordinary demand. Some months ago I asked a leading automotive manufacturer connected with the aircraft production whether he expected to be able to get the tools he had to have. He said, 'In the last ten years I have put over \$25,000,000 into machine tools and there is not a manufacturer who is not going to give me what I want.' He ordered his gear cutters and lathes and milling machines and what-not. When I saw him a few weeks later, he said, 'Look at this sheet. Those are my delivery dates. Now don't you think I can get the stuff? I am an old hand at this game.' That was all right until the Priority Board said, 'These tools are needed more elsewhere.' He got only a small percentage of the tools he expected within the specified dates. He endeavored to get thread gauges and other articles, and the same thing happened. I saw him a few weeks ago and he had not received all his tools yet. There is universal delay in such things and it is always interpreted against the particular thing that the particular critic wishes to criticize.

Shipments Now Go Forward on Schedule

"The airplane products are coming along fast. There has been some delay on account of our inability to decide finally on machine gun equipment and types of bombing devices. While waiting until final decisions were received from the other side (the difficulty has not been all on this side; there has been a change of mind on the other side not infrequently), many a thing which was started has been stopped and then started again. We have had confusion on account of changes

The annual election of officers resulted as follows: President, F. H. Butts, Butts & Ordway Co., Boston; first vice-president, W. H. Grant, Bonniwell-Calvin Iron Co., Kansas City, Mo.; second vice-president, S. L. Orr, Orr Iron Co., Evansville, Ind. Executive committee (for three years), J. B. Carse, Ogden & Wallace, New York; Andrew Wheeler, Morris Wheeler & Co., Philadelphia; for two years, W. L. Niekamp, Beck & Corbitt Iron Co., St. Louis, to fill the unexpired term of S. L. Orr.

in specifications made here. There have been put into the great Governmental and industrial organizations thousands of people who have been unfamiliar with manufacturing methods. We have had that to contend with. That sort of thing is wearing away. It is becoming more appreciated that people who have spent all their lives in the shop really know something about it and that those who have been able to make things before are able to produce for the Government. Last week we shipped from the factory with which I am connected 42 of the fighting machines with 75 per cent spares. When you ship four machines you really ship seven; so that if you ship 40 machines that is really equal to 70 machines. That production is coming right along. We have done in our method of manufacture what all of our American aircraft people have done; it is possible to build aircraft to-day by the interchangeable method just as it is possible to make anything else, and that is being done."

The British Tin Situation and the United States

A clear presentation of the tin situation in England and its relation to the United States is given in the following from the *London Ironmonger* of recent date:

Fresh trouble has arisen in the tin trade owing to the changes that have been brought about by the war and to the efforts of an official body to direct the course of trade. Previous to the war, merchants in London bought tin from the Straits and sold it to the Americans. Most of this tin was imported into England by a small number of firms, who also purchased metal in the Straits and shipped it direct to the Pacific Coast of America. The prices paid on the London Metal Exchange, however, practically ruled the rates at which tin was dealt in all over the world, but the war caused a large and increasing portion of the trade which had passed between this country and the United States to be conducted directly between the Straits and America.

Recently the exports of Straits tin to America were entirely prohibited, although the export of English tin under license is still allowed. The exports from Great Britain and from the Straits are both controlled by the Tin and Rubber Committee, and as that Committee declines to grant permission to export tin from the Straits to America to firms which were not in that branch of business before the war, merchants in London who a couple of years ago had a fair proportion of the whole American trade in their hands find themselves not only debarred from exporting tin from this country to the United States but also from participating in the direct trade between the Straits and America. As a result, the whole of the American trade has been diverted into the control of some half-dozen firms, known in the trade as "importing houses," and to those firms the American customers of the merchants who were engaged in the trans-Atlantic trade must now go if they want tin. Another new development in the situation is the fact that two American firms are able to buy direct in the Straits.

The merchants who have been engaged in the trans-Atlantic trade regard as unjust the refusal of the Tin and Rubber Committee to grant them a share in the Straits-American trade to offset their loss of the former traffic, and have protested to the authorities. On the other hand, the importing houses, whose trade is limited to the quantities for which they can obtain export licenses, are understood to object to the intervention of the merchant firms.

As a token of the company's appreciation of their ten years or more of loyal co-operation, President Alvan Macauley will present to 160 employees of the Packard Motor Car Co. a gold watch and chain. Among the recipients will be three women.

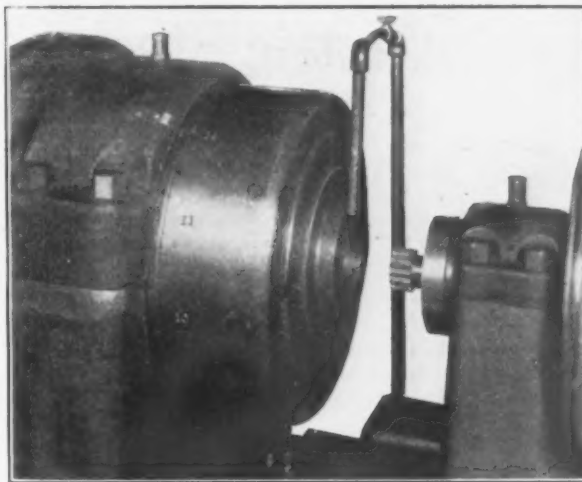
Thread Milling Machine for Shell Work

A new machine designed for milling threads on high-explosive shells and for various commercial work has been brought out by the Biggs-Watterson Co., Cleveland. One of the most important features of this machine is that the work spindle and the lead screw are both rotated from a single worm drive. This, it is pointed out, assures a powerful, positive and sensitive drive, as well as a maximum of accuracy and precision, and at the same time eliminates a long train of reduction gearing. This driving mechanism includes the driving worm *a*, the spindle worm gear *b*, the lead screw worm gear *c*, change gears *d* and *e*, the idler gear *f* and the reduction gears *g* and *h*.

The work spindle has a hole bored through its entire length up to the capacity of the machine, making it possible to insert work at either end, as well as to hold work of any length. The spindle can also be equipped with an air chuck. The work and cutter spindles are driven by a single pulley from a countershaft. Right-angle or direct-connected motor drive can also be furnished. The cutter spindle is made of high-carbon steel running in a bronze bearing with provision for oiling.

The carriage is moved along the bed longitudinally by a lead screw which enters a long cylindrical nut *i*, which is gripped at any predetermined point by a clamp attached to the carriage. When in a clamped position the nut moves with the carriage, and when released returns automatically to the starting point. This return is effected by two coil springs *j* and *k*, one right-hand and one left-hand spiral spring. The lead screw can be turned to either the right or to the left for cutting either right or left hand threads. The lead screw is thus kept under tension at all times, eliminating any back lash. The coil springs are anchored into one end of the cylindrical nut, and at the opposite end the spring enters into an adjustable friction *l*. This friction can be set at a tension so that should the springs be wound up too tightly, the friction will revolve around the lead screw and prevent breaking.

The machine is provided with a single-lever control which consists of a camshaft along the front with a lever at the side of the handwheel and directly in front of the operator. This camshaft is connected to the work spindle clutch lever, and to the lead screw clamp. When the spindle has made one complete revolution it turns the camshaft over, moves the cutter spindle back, lifts the cutter out of the work, disengages the clutch, stops the spindle, releases the clamp, and leaves the carriage free to move on the ways. When a new piece of work is to be chucked the operator pulls the control lever which brings the cutter into the work at the right depth, starts the spindle and clamps the carriage to the lead screw, thus making the action nearly automatic. The handwheel is used only for making sensitive adjustments to the cutter. The threads of any pitch either



Internal Threads on High-Explosive Shells as Well as on Commercial Work Are Cut in a New Thread Milling Machine

U. S. standard or metric, right or left-hand, can be obtained by simply changing two gears, no compounding of gears being necessary. The machine is also provided with an automatic knock-out.

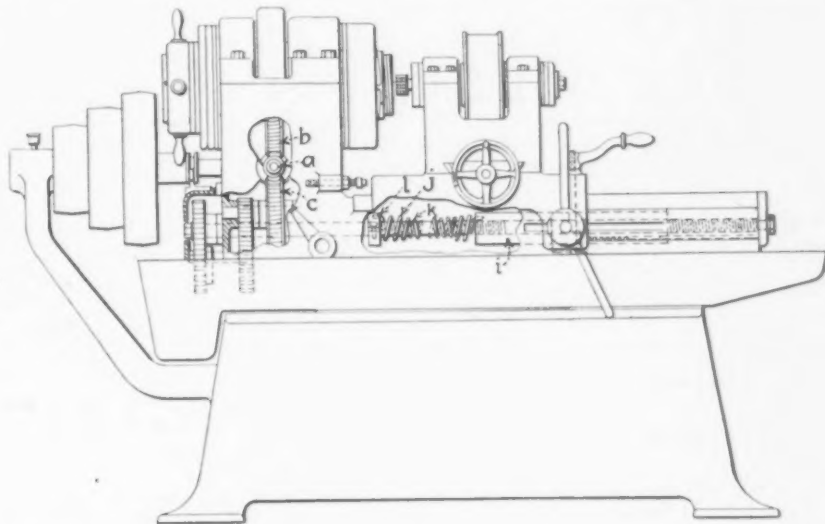
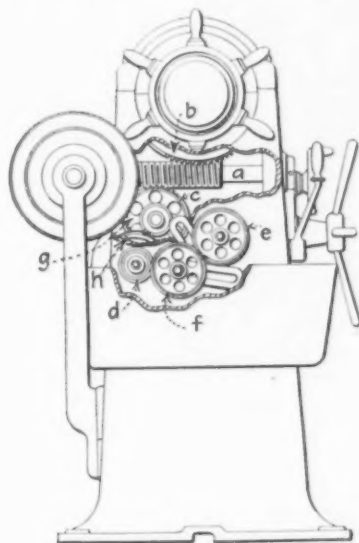
The head and the bed are cast in one piece which, together with the oil pan is mounted upon the pedestal, insuring strength and rigidity. All gears are fully enclosed, and all the control levers are located on the front of the machine within the easy reach of the operator.

This machine is being made at the present time in two sizes, a 3-in. and a 6-in. The principal dimensions and specifications are as follows:

Size of machine, in.....	3	6
Collet capacity, in.....	3 1/4	6 1/2
Diameter of lead screw, in.....	1 1/4	1 1/2
Ratio of worm drive.....	100 to 1	100 to 1
Width of belt, in.....	3	3
Floor space, in.....	36 x 76	36 x 76
Net weight, lb.....	3,000	3,500

The machine can be furnished with a taper attachment for cutting threads on pipe and similar work. The regular equipment includes a countershaft, an oil pump and the necessary piping.

The first strike in the thirty years' existence of the Phoenix Mfg. Co., Eau Claire, Wis., occurred on May 23, when 50 employees of the foundry department walked out to enforce a demand for increased wages. The remaining 150 or more men continued their duties as before. A statement at the offices of the company said that the men were given an advance in wages about 30 days ago and the demand was considered unreasonable. It is expected that the strike will be settled within a short time, as the company is devoting practically its entire capacity to Government work.



The Work Spindle and the Lead Screw Are Driven through Worm Gears from an Interposed Common Worm, While the Quick Return of the Carriage Is Effected by Two Coil Springs

Electric Steel for Small Castings*

Improved Operating Methods and Furnace Construction—Heat Treated Alloy Castings in Place of Forgings—Reversed Duplexing

—BY R. F. FLINTERMAN—

IN the paper, "Electric Process for Small Steel Casting," delivered in Detroit before your society in May, 1917 [abstracted in *THE IRON AGE*, May 10, 1917], a process to which I gave the name of "Reversed Duplexing," was brought to the attention of the society. Briefly, this process consisted of making steel in electric furnaces, say two or more, at least one of which was run with basic lining, and the rest of the furnaces were to be run with acid lining. The plan proposed was to use the basic furnace as a feeder for the acid-lined furnaces. The basic furnace would use lower-priced scrap, and refine it for sulphur and phosphorus, and the resultant dephosphorized and desulphurized steel would be transferred to the acid furnace, which in the meantime had been melting steel scrap in the usual manner, and would receive the refined charge from the basic furnace after its own charge (that is the acid charge) had been completely melted. The furnaces would be of such size and their operation so timed that the total output of all the furnaces so run would be the same as though they had all been run independently.

The advantages set forth for this "Reversed Duplexing" were as follows:

The cost of at least a part of the raw material would be lower.

The basic furnace could be run at a comparatively low temperature during the refining period, and the life of roof and walls would be prolonged. The final temperature could be attained in the acid furnace, where necessary temperature and fluidity can be attained without injury to the lining.

The final metal would be lower in sulphur and phosphorus, and the process properly carried out would cost less than metal produced by the acid process.

The final deoxidation would be carried out under an acid slag.

The great advantages obtained because of this final refining under an acid slag were pointed out in my earlier paper and need not be repeated here. The writer intimated therein that we might soon be in position to give the "Reversed Duplexing" a thorough trial. As yet we have not been able to do so, and it may be interesting to know why we have not done so. The main reason is that we have been able to increase our tonnage to such an extent with our present furnace equipment, that the addition of another furnace would not be economical.

Attaining Increased Output

In May we were producing about 42 tons per day, which is just about the rated capacity of a 6-ton furnace and a 3-ton Heroult operated together. Making five heats each per 24 hr. would make a total of 45 tons for the two furnaces, and we might add that it took us a year or more to be able to attain this tonnage regularly. Now, however, we average close to 60 tons per day, and have actually made 64 tons per 24 hr. and expect to attain an average of 70 tons.

These performances are due to two things: A general improvement in our methods, and some slight changes in our furnace construction.

As regards our own methods, we cut down the time necessary for all operations, simply because the entire furnace crews are much better acquainted with the apparatus they are working with. The installation of a bonus system has speeded up everybody. The melters and helpers are on a bonus tonnage system. The chargers (and by the way all charging is done by hand)

are paid under a system which pays them a high wage if charging is done in a short time, and a much lower wage if charging consumes a longer time than necessary. We have also installed a new crane which serves the furnaces alone, so that no time is lost when the crane is needed at furnace. So much for our own methods.

Changes in Furnace Construction

As regards the change of furnace construction, we derived our inspiration from the paper presented by A. A. Meyer on "Electrical Characteristics of Electric Furnaces," which paper was also presented at the same general meeting in Detroit in May, 1917.† I will quote one paragraph from this paper.

"Next, a few readings were taken of the voltage drop over the various portions of the bus leads to the electrodes and also of the drop across the arc itself. Starting at the transformer and passing over the bus toward the electrodes, the points selected are designated as points 7, 1, 4, 2, 3, 8 and 6. Oscillograms Nos. 120, 122 and 124 were obtained. It was found that of the total voltage available at the transformers as high as 24 per cent was lost as drop in the copper bus between the transformer and the electrodes, the balance being available at the arc. This seems like a large bus drop and is due not so much to the copper resistance as to the reactance of the bus circuit. To determine in what portion of the bus the greatest drop occurred, measurements were taken between points 1 and 2, and compared with those between 2 and 3, and it was found that the drop per c.m. foot in the solid bus was over three times as great as in the flexible leads. Now, on account of the large cross-section of the bus to handle the large currents, skin effect may be a big factor in reducing conductivity of the present bus, but it is believed that the induction of the neighboring steel work is largely responsible for the greater drop in the bus bars. On account of the necessary steel work giving support to the busses and the electrodes and its close proximity and unequal exposure to the different phases, considerable induction is introduced which cannot be easily avoided."

Further, under his conclusions, Mr. Meyer writes as follows:

Attention was called in this paper to the large voltage drop in the secondary busses going to the electrodes. It was found that about 24 per cent of the available voltage at the transformer was lost as drop in the short bus between the transformer and electrodes. This was unquestionably due not to resistance, but to reactance which was introduced in the circuit by the neighboring steel structure of the furnace. Tests along various sections on this bus showed that the drop per c.m.-foot in the bus going through the steel structure, and with a current density of about 1.3 amp. per 1000 c.m. (0.05 sq. cm.) was over three times that in the flexible bus leads more remote from the steel work and where the current density was about 1.7 amp. per 1000 c.m. (0.05 sq. cm.). The desirability of such reactance is a matter somewhat in dispute. On the one hand, the value of such reactance is claimed in its effort to cut down or limit sudden rushes of large currents. It should tend to smooth out the sharp peaks. However, it does not appear to have such great effect in the oscillograms. On the other hand, reactance in such a place is detrimental to the voltage regulation and causes a big reduction in the voltage available at the arc. It is of course primarily due to the bus bars passing through or in close proximity

*From a paper, "Electric Steel Castings," presented at the thirty-third general meeting of the American Electrochemical Society on its Southern trip in the week of April 28. The author is president and general manager Michigan Steel Castings Co., Detroit.

†Trans. Amer. Electrochemical Society, 1917, 31, 97.

to the steelwork. Its magnitude cannot be easily evaluated because of so many unknown factors, and consequently little attention is sometimes paid to it in designing furnace installations. In view of its usually unknown value and the heavy currents to be dealt with in furnace work, it would seem more desirable to reduce it to a minimum and figure on a more definitely known inherent reactance to be incorporated in the power transformers. Closed magnetic circuits around or near any of the electrode circuits are objectionable for various reasons and should be avoided as much as possible.

You are familiar with the old method of bus-construction on the Heroult furnace. The 6-ton furnace has eight solid bus bars $\frac{1}{4} \times 6$ in. (0.6 x 15 cm.) solid copper 7 ft. (2.1 m.) long, for each phase, placed triangularly with 20 in. (50 cm.) between phase centers. These bus bars just described lead from transformers to flexible cables. The latter are about 20 ft. (6 m.) long, consisting of nine 1,000,000 circular mil stranded copper cables for each phase. The flexible cables connect in turn to bus bars on furnace proper, the latter being made up of six copper bars $\frac{1}{4} \times 6$ in. (0.6 x 15 cm.) in each phase, running first vertically and then horizontally to the electrode clamps.

The Solid Bus Construction

In case of both the bus bars between the transformers and the flexible cables, and also the bus bars on the furnace itself, the $\frac{1}{4} \times 6$ -in. (0.6 x 15-cm.) copper bars were spaced by means of $\frac{1}{4} \times 3 \times 6$ -in. (0.6 x 7.5 x 15 cm.) copper spacers. These spacers have all been replaced by vulc-asbestos spacers. In addition, mica insulation was placed between the various bus-bar leads in such a way that the different parts were isolated and made to act as nearly as possible independently from one another. We find that these small changes have made a great change in operation of furnace. From all indications it would appear that the drop in voltage found by Mr. Meyer has been much reduced. This point will be more clearly established by a series of tests which will be undertaken in the very near future.

At any rate, it is safe to assume that part of the drop was due after all to skin effect, and that it was not entirely due to induction set up in the steel construction at rear and top of furnace, as Mr. Meyer stated in his paper.

Under the circumstances, it would be much better to do away with the solid bus construction entirely. The later Heroult furnaces are now constructed as is our 3-ton furnace, where the flexible cables are carried direct to the upper part of the steel structure at back of the furnace. It would seem even better to us to carry the flexible cable directly through to the electrode clamps. There would of course be some induction set up in the steel structure, but we do not believe there would be as much voltage drop as there is now. At any rate, as now constructed, our furnaces are running much faster than formerly, and our current consumption is regularly lower than it was before. On one run of 24 hr. 11 heats were taken from the 3-ton furnace. Our average current consumption for the week, including all delays and stops, is running under 625 kw.-hr. per ton. Since our work is light, and our metal must be brought to a very high temperature, we consider this a very low consumption.

With our tonnage brought to this high figure, our floor capacity is taxed to the utmost. An additional furnace would therefore be superfluous and uneconomical. The only opportunity for "reversed duplexing" in our own shop would be to change the 3-ton furnace to basic lining. Under present pressure of work this is of course impossible, and the actual trial of duplexing must therefore wait.

Electric Alloy Steel Castings

There is one other point referred to in the writer's former paper which I desire to touch upon here, namely, the great possibility of the electric furnace in production of the various steel alloys. This one feature is perhaps of greater value and interest to the makers of tool steel, but I am firmly convinced that there are

wonderful possibilities in the manufacture of heat-treated alloy-steel castings. This is a field which is almost untouched and is well worth investigating.

I quote for a moment from Major C. M. Wesson's paper on "Steel Castings for Ordnance Construction," presented at the Boston Meeting of the American Foundrymen's Association in September. Major Wesson says in his introduction:

Special heat-treated and alloy steel castings offer a wide field of endeavor and our knowledge is rapidly increasing concerning them. The prediction is ventured that eventually they will replace the high-grade intricate forgings, just as the plain casting, as we know it to-day, has supplanted, in a large measure, the plain forging. We have, however, not time to dwell on them here.

I agree with this statement thoroughly, although I do not draw the line just where Major Wesson does. Small forgings will always continue to be used and will prove cheaper than steel castings wherever they are needed in sufficient quantities, so that die-cost will be a small item for forging. As forgings increase in size or in intricacy, a point is reached where die cost is so excessive and manufacturing cost so high that a steel casting can be made for less money than a forging. But even so, the user or buyer of this class of forging must still have to be satisfied on two very important points before he would substitute a casting for any forging; and these two points are:

He must know definitely that the castings have been made by careful scientific methods, so that soundness and absence of imperfections can be guaranteed.

The metal must be of very high physical quality, and in many cases demands will be such that only a heat-treated alloy casting would fill.

Tests of Vanadium Alloy Castings

During past months we have been experimenting along this line and wish to refer briefly to some wonderful tests we have been getting from vanadium steel. These tests have been obtained repeatedly, so that we are confident that we can reproduce them commercially. The tests are the following:

	No. 1	No. 2
Ultimate strength, lb. per sq. in.	102,000	103,800
Elastic limit, lb. per sq. in.	81,500	84,000
Elongation in 2 in., per cent.	23	21
Reduction in area, per cent.	48	47

There is one more point. In the discussion of my paper before this society in May, Prof. J. W. Richards said:

Regarding the general question of the fitness of electric furnace steel for steel castings, for the information of the Naval Consulting Board I sent a questionnaire to about 40 or 50 of my friends in the steel business, asking how a better class of steel castings could be obtained. About 19 out of 20 of these answers were that if they would specify electric furnace steel for their castings that, other things being equal, there was a far better chance of getting a fine casting from electric furnace steel than from any other class of steel.

This statement of Prof. Richards sounds strangely prophetic, when read at this time in the light of what has happened since these words were spoken. Referring to our own experience, we are furnishing considerable quantities of army castings under Class No. 2 and No. 3 specifications, and are also making navy castings under Class B specifications, and are having little trouble in meeting these specifications.

Exceeding Government Specifications

We do not want to give the impression that these results are being obtained without any particular effort on our part, for quite the contrary is the fact. The heats are held for analysis before pouring, and every possible effort is made to have carbon and manganese where we desire them, before the heat is poured. Annealing is carefully carried out in new ovens recently installed, and here again every care is taken to see that annealing is exactly what we have planned it to be.

The result of these precautions is that we are passing Army and Navy tests regularly. We do not hesitate to say, however, that with the same precautions we would fail on many of the tests were we using converter steel. At least that was our experience

when we made converter steel, and it is our belief that many converter foundries are having this same trouble at the present time.

The tests that we are obtaining are interesting in one way. They rather emphasize the fact that the specifications were not written for electric steel. For instance, Class No. 2 army specifications:

	Call for	We obtain
Ultimate strength, lb. per sq. in.....	75,000	75,000
Elastic limit, lb. per sq. in.....	35,000	40,000
Elongation in 2 in., per cent.....	15	20
Reduction in area, per cent.....	20	30

In the same way Class B navy specifications:

	Call for	We obtain
Ultimate strength, lb. per sq. in.....	60,000	65,000
Elastic limit, lb. per sq. in.....	27,000	35,000
Elongation in 2 in., per cent.....	22	30
Reduction in area, per cent.....	30	40

In addition to the above a 120-deg. bend test is required, which usually shows a bend up to 170 deg. or 180 deg.

You will note in each case we obtain well over 50 per cent of the ultimate strength as elastic limit, while both the army and navy specify about 45 per cent. Average tests of electrical steel will run pretty close to 60 per cent.

This army and navy steel casting experience is really a great education for many of the steel foundries, and is bound to have a marked influence upon the industry after the war. Instead of a statement of hoped-for qualities, competition will demand physical test coupons, which must stand certain tests and the castings will be accepted or rejected on the basis of these tests. It is needless to add that castings sold under such an arrangement must necessarily be of a uniformly higher grade than the average run of steel castings now sold.

Magnesite from California

The production of magnesite in the United States has grown from 9000 tons in 1913, to over 300,000 tons in 1917, some 200,000 tons coming from California and about 100,000 tons from Washington. When magnesite was first mined in the West very little attention was paid to the quality, so long as the material was produced. Now that large deposits have been developed more attention is being paid to quality. The first shipments which went forward from California required treating by various refractories companies in the East before it was fit to be used in the making of magnesite brick or as grain material in basic open-hearth furnace bottoms. The magnesite that was imported in the pre-war period arrived in such shape that it was not necessary to treat it in any way for the above purposes. In 1917 California opened a large magnesite deposit which contains mineral said to be similar in quality to the formerly imported Austrian magnesite. It is calcined at the property and is shipped in a thoroughly dead burned state to the Eastern markets.

Thus far there has been just one district in which this particular class of magnesite has been discovered. It is in Napa county, Cal., 21 miles northeast of St. Helena. The mine, known as the White Rock, is owned and controlled by Frank R. Sweasey and R. D. Adams, San Francisco, Cal. They state that they are producing on an average over 200 tons of crude magnesite daily and ship approximately 50 to 60 tons of dead burned magnesite to the Eastern markets each day. Eleven vertical kilns have been installed for calcining, and auto trucks haul the finished material from the calcining plant to Rutherford, on the Southern Pacific Railroad system for transcontinental shipment. Considerable is used on the Pacific Coast by local steel companies, and their wants are all supplied from this property.

In obedience to the order of the Metal Trades Council, issued May 23, shipworkers, said to number nearly 10,000, quit work in British Columbia shipyards on that date. The purpose of the strike, union officials stated, is to compel the Imperial Munitions Board to grant a scale of wages equal to that in effect in the United States and a 44-hr. week.

TO READJUST INDUSTRIES

Standardizing Manufacture of Agricultural Implements and Many Other Products

WASHINGTON, May 28.—A conservation project of broad scope involving the standardization of agricultural machinery and farming implements with a view to the elimination of the largest possible number of models and types that can be dispensed with during the war is now being worked out in detail by the conservation division (formerly the commercial economy board) of the War Industries Board. The plan, which is the most comprehensive of any thus far undertaken by the Government, is intended to release skilled labor and manufacturing facilities for war work and to reduce the variety and volume of stocks which must be carried by wholesale and retail distributors. As it is the intention of the conservation division to follow up this adjustment with others representing a great variety of industries the details of the survey now on foot and the final action of the board are of very general interest.

In addition to the general purposes of this project one of the aims of the Government in eliminating all non-essentials in the way of agricultural machinery and farming implements is to insure the largest possible output of such equipment as is absolutely necessary for use during the war period and to keep the price of the finished product to the farmer as low as possible by maintaining the overhead manufacturing cost at the minimum. Extreme caution will be exercised to avoid cutting out implements which may be of prime importance in some sections of the country although non-essential in others.

For the purpose of bringing the matter to the attention of as many interested parties as possible the conservation division has prepared a questionnaire in which suggestions are solicited as to the retention or abandonment of various types of implements. This questionnaire solicits opinions as to the desirability of eliminating certain specified types of agricultural machinery and farming implements which preliminary investigation has demonstrated have been adopted by the trade as the result of competition and which are not essential to modern farming operations. For example, in the case of steel plows, the conservation division has learned that no less than 15 types made by leading manufacturers have been brought out from time to time to meet special conditions or because they represented a slight improvement, either real or fancied, over any previously on the market. Inquiry has also developed the fact that these types, which it is suggested are not necessary, engage a disproportionately large part of the manufacturing facilities of the industry and, therefore, increase the overhead expense to a point that tempts producers to transfer a part of this cost item to standard lines of goods. It is argued, therefore, that if these types are abandoned there will be a substantial economy in the manufacture of standard essential types.

Evidence has also been secured indicating that under competitive conditions manufacturers have been induced to make many more sizes of plows than are necessary.

It is not the purpose of the conservation division to take radical action at variance with the opinion of those representatives of the trade best qualified to measure the needs of the consumers. The questionnaire now being sent out by the division will go to practically all manufacturers and jobbers and the opinions of representative retailers will also be entertained. The national trade associations will be counted upon to gather the views of their members and to present them in the form of a symposium that will accurately reflect the general attitude of those engaged in the industry.

Manufacturers, dealers and others interested in this important matter can obtain a complete copy of the questionnaire, which is a voluminous document, by addressing the conservation division of the War Industries Board.

A 61-in. Boring and Turning Mill

As a further development of its vertical boring and turning mill, the Bullard Machine Tool Co., Bridgeport, Conn., has brought out what it terms a 61-in. maxi-mill. It is designed to eliminate waste time and thus effect reductions in the cost of the work which it produces as well as requiring but little maintenance while at the same time it possesses ability to withstand severe usage.

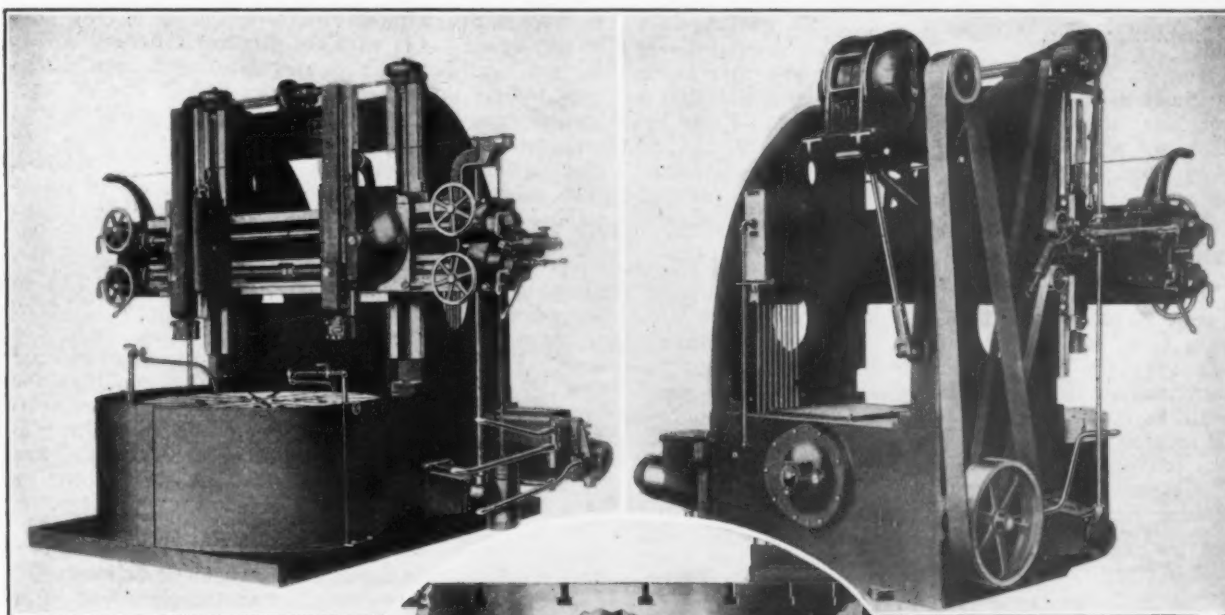
As is natural the design follows more or less closely that of its prototype but, of course, handles larger work. The table which is 61 in. in diameter has parallel T-slots for the use of four face-plate jaws and work up to a maximum diameter of 63 in. can be handled. The maximum available height under the cross-rail and toolholders is 52 in. Sliding gears and positive friction clutches operated by conveniently located levers which interlock with the clutch and the brake lever provide 12 table speeds ranging from 2.5 to 42.18 r.p.m. The table is guarded and crank handles and square end shafts have been eliminated through-

is maintained. The spindle seat is lubricated by an oil groove cut in it and the overflow of the oil is relied upon to lubricate the gear and pinion driving the table as well as their bearings.

The mill which has a net weight of 28,000 lb. occupies a floor space of 11x13 ft. when equipped with motor drive. The minimum over-all height is 118 in. and when the bars are in the extreme upper position this distance is increased to 130 in.

Westinghouse Electric & Mfg. Co. Earnings

The net income of the Westinghouse Electric & Mfg. Co., and its proprietary companies, except the New England Westinghouse Co., for the fiscal year ended March 31, 1918, available for dividends, etc., was \$15,405,680.89, according to the report of Guy E. Tripp, chairman of the board of directors, or a decrease of \$2,674,207.94 from the net earnings for the previous twelve months. The consolidation of accounts resulting from the merger of the Westinghouse Machine Co. was effected as of June 15, 1917, without change in the sur-



out the machine thus protecting the operator at all times. Hammer handwheels, so-called, have been provided to give fine settings of the tools. Vertical or horizontal feeds ranging from $1/96$ to $1/2$ in. per revolution of the table are available in eight steps.

The tool slides are box-form castings with inserted holders. A vertical movement of 36 in. through a steel rack and pinion is provided and the holders may be swiveled to a maximum of 45 deg. on either side of the vertical center.

As regularly built, the machine is driven by a belt connection from the countershaft to a driving pulley which is 24 in. in diameter with a $5\frac{1}{2}$ -in. face and runs at a speed of 405 r.p.m. From this point power is transmitted through heat-treated, oil tempered, alloy steel gears and shafts. If desired a 15-h.p. constant-speed motor can be mounted on a bracket at the rear of the machine and connected to the driving pulley by a belt.

All of the bearings and gears having a fixed relation to the bed are lubricated by a continuous flow system. This is operated by a pump which is directly connected to the main driving shaft and circulates doubly screened and filtered oil at all times when the main driving pulley is in motion. To lubricate the table spindle a continuous stream of oil is forced into the oil reservoir where a constant level

Special Arrangements for Lubricating the Bearings and the Table Spindle Continuously and Supplying Cutting Lubricant to the Work Characterize a New 61-In. Boring and Turning Mill

plus of the company. The gross earnings for the year including shipments since June 15 from the Machine Works (formerly Westinghouse Machine Co.) amounted to \$95,735,406.75, which after deducting cost of sales including all factory costs, general expenses and taxes, yielded a net manufacturing profit of \$15,509,469.84.

The value of unfilled orders in hand April 1 was

\$147,857,580 of which \$110,185,007 was for regular products of the company. This latter compares with \$39,776,739 unfilled orders one year previous and \$22,097,995 two years previous. The surplus March 31, 1917, of \$18,105,298.66 increased by the net income of \$15,405,680.89 for the past fiscal year, gives a gross surplus of \$33,510,979.55, as compared with \$27,326,595.86 on March 31, 1917.

In addition to regular quarterly dividends at the rate of 7 per cent per year on the preferred and common stocks, a special Red Cross dividend was paid, making \$5,610,848.11 in dividends paid during the year.

The loss sustained by the New England Westinghouse Company through the cancellation of the Russian rifle contract was \$5,000,000, against which a reserve was set aside last year. The absorption of this account in this reserve was authorized and made on the books as of Dec. 31, 1917.

The Place of Democracy in Business

Lessons of the War for Employers and Employees—The Labor Question the Great Economic Issue Before the World

BY CONSTANTIN FRABONI*

ANY large commercial or industrial enterprise may be likened to a little state. It has a supreme head, special leaders over various departments, and a sort of local self-made constitution which controls and regulates the existence, position and welfare of a definite number of persons. The efficiency resulting from the policy adopted by the leader of such an enterprise toward its dependents is like that resulting from the policy employed by a government toward its subjects.

Formerly it was thought that people working in a mine, or factory, or on farms, being comparatively ignorant, could be ruled only by drastic and harsh methods of discipline. A workman was considered a machine, hired to execute a certain work. From the morning whistle to that of the night, for 10, 11, and very often 12, consecutive hours, he was constrained to work under the scrutinizing eyes of a supervisor who, at the first sign of neglect or fault, fired him without pity.

During my long experience in factories and offices how many times have I not heard managers, superintendents, directors and foremen say: "This is a business place and not a school or a charity institution. We are here not to teach or do missionary propaganda; we pay a man for working, and if he doesn't work as we want, well, let him go—there are hundreds of men outside the door who need bread." That was the too sad truth! One might see, all day long, in the street, near the gate of every plant, a crowd looking for a job. It was the fear of finding himself among this crowd that compelled the workman to submit to all requirements imposed by the boss.

The Man Behind the Worker

A very important psychological truth was lost sight of—that a working body contains a soul, and that the efficiency of the body to do a definite thing depends entirely upon that soul. Many industrial leaders, by missing this essential fact, have rashly used a wrong policy, the effect of which sooner or later has been to bring about failure in business. We are not surprised if such leaders do not understand why a man, under certain circumstances, is unable to do his regular work. They cannot recognize—or what is more apt to be the case, are unwilling to recognize—that a fellow who is indisposed, who has lost a member of his family, who has quarreled with his wife, or missed his car in the morning, consequently has his mind elsewhere, and therefore is unconsciously distracted, slow and careless in a manner contrary to his habit. A reprimand made in a harsh way to a man under such conditions will without doubt irritate him, make him lose control of himself, and act in a way absolutely different from that in which he would normally act. How altogether different would be the effect of a cheerful "Hello, Bill!" said in the morning by a foreman or superintendent to a depressed man; it would change his disposition, and very likely increase the efficiency of his day's work.

What has been the result of such an erroneous policy? Strikes, sabotages and crimes; a wide spreading of socialistic doctrines and anarchical factions.

Legislation for the regulation of labor conditions has been provided from the oldest times by almost all civilized countries, but such measures have been hon-

ored more in the breach than in the observance. It is only in the last two decades that really helpful laws have been promulgated and strictly enforced, especially in this country. The laws regarding working hours, wages, compensations in case of injury, health and safety of laborers contemplate not only the welfare of men, women and children, who are obliged to work for their own and their dependents' subsistence, but also the welfare of the whole community and state.

Labor laws, however, will never reach completely their objective without full co-operation on the part of employers. It is with the greatest satisfaction that we can say that such co-operation, with rare exceptions, exists throughout the country. It has at least been learned that the success of an enterprise depends in great part upon the relations existing between employers and employees. Upon the ability to establish such relations and upon the methods used in maintaining them depends the more or less successful minimizing of that eternal and irreconcilable conflict between labor and capital. The amount of co-operation given by labor to capital is directly proportioned to the amount of co-operation given by capital to labor.

As a political democracy is a *sine qua non* to the prosperity and welfare of a nation, so commercial and industrial democracy is an essential condition for success in business. The democracy which predominates in every phase of American life, from the executive head down through all the social fabric, has made the United States the most prosperous country of the world.

What Is Democracy in Business?

But what is the meaning of "business democracy?" Certainly it does not mean that the president of a bank has to take his clerks to lunch with him, or that a superintendent of a factory will invite his laborers to a theater party, and that all semblance of authority be done away with. Such business democracy would inevitably degenerate into a business anarchy. The abolition of any leadership and authority is a socialistic utopia which can only bud in some ignorant or idealistic mind. If it could ever be realized its duration would be very short, for it would degenerate inevitably into the worst autocracy, such as that prevailing in Russia now.

The foundation of a successful business democracy is the strict observance of the duties which the employer has toward his employee, and the employee toward his employer. But the mere observance of such duties is just a foundation and nothing else. It is upon this foundation that the very edifice of democracy has to be built. Three factors are indispensable to the erection of the edifice: material, workmanship and co-operation. The first of these factors is given by the employer, the second by the employee, the third by both. Upon the good quality of the material, upon the efficiency of workmanship, and upon the completeness of co-operation, will depend the strength and durability of the edifice, that edifice which has to become a veritable shelter for both employer and employee. The weakening of one of the three pillars in support of this common shelter will cause sooner or later its downfall.

The duties which were mentioned above are the connecting links of the two contracting parties, the one of the first part, who gives his own physical or mental energy for a definite compensation, and he of the second part, who remunerates the usufruct of such an energy. But what will happen if both contracting parties act exclusively according to the letter of their

* Mr. Fraboni is now connected with the Miller Lock Co., Philadelphia. For 15 years he held a managerial position with a large Belgian company producing iron and steel in Russia. He has made a study of labor conditions in many large and small plants in Belgium, France, Russia and the United States.

agreement, without considering its spirit? A dry and mechanical performance will result, functioning in a monotonous, lifeless and unsatisfactory manner.

The Italian Strike

There is the peculiar "Italian strike," so called because it originated in Italy, which seems to have been used particularly by railroad employees. It consists in doing exactly and exclusively what is prescribed by the railroad regulations. I remember, when such a strike took place about ten years ago in Russia that it resulted in such chaos that all traffic became impossible and had to be stopped. No punishment might be inflicted, no salary deducted, for nobody had transgressed or come short of his duties. We see, then, that business cannot be ruled successfully by the mere observance of laws and regulations, and that these laws and regulations of themselves will not produce the benefits for which they are made, unless they are accompanied by some other indispensable and hardly definable elements, such as education, initiative, ingenuity, fair play, good morals, sentiment, toleration and strong will on the part of both employer and employee.

The employer by developing the intelligence of his employee by making him morally and pecuniarily satisfied improves his efficiency, draws larger profits for himself, and in addition increases the productive power of his country and so contributes to the common welfare. On the other hand, the employee, by appreciating the interest taken in his comfort and welfare, by acting conscientiously, and by intensive work, develops his intelligence, capacity and efficiency, becomes a necessary factor for his employer, draws larger wages, increases his own and his dependents' comfort, acquires an economical independence, and contributes also to the progress of his country.

The Labor Turnover

The widely used method of "hiring and firing" has been statistically proved extremely detrimental to any industrial concern. This fact has been recognized by almost all manufacturers, even the less farseeing. They have recently established in their plants special employment departments. The work of such a department does not consist only in the examination and selection of applicants, in order to give them jobs more fitted to their capacities, but also in the determination of reasons which make the selected man fail in doing that which was expected of him. A factory at the present time very seldom fires a workman who is willing to work, but happens to be appointed to a job which is not in accordance with his aptitude. It has been found that such a man is always able to do something somewhere and at least become useful to the enterprise.

Unfortunately, we have a large group of men and women who willingly and constantly quit one place for another without any plausible reason. These people have not patience enough, or constancy, or firm determination, to learn thoroughly a trade. They are never satisfied with their jobs; they go here and there, from a hosiery mill to a confectionery shop, from a shoe factory to a weaving plant, thence to a machine shop, and so forth during all their lives, looking always for an easy and soft job, which, with a minimum of application and fatigue, will give them the maximum of wages. They find everywhere the same disappointment; they think themselves victims of society; get in trouble themselves; try to get their fellow-workers in trouble; preach erroneous socialistic and anarchistic doctrines; foment disturbances against any kind of organization, and bring about strikes.

Such people are the parasites of the industrial world, therefore it is the duty of the members of an employment bureau to detect such parasites, try to convince them of the falsity of their tenets, give them a chance to redeem themselves, then, in case of failure, without losing time, get rid of them, and this in the interest of business and of all the employees.

As I mentioned before, a commercial or industrial enterprise, although composed of the most capable

leaders and of the most skillful laborers, will not progress and succeed without co-operation. This co-operation is the result of a reciprocal esteem and good will based on democracy. The effect of democracy will be nil, if there is not honesty and loyalty, the indispensable qualities to reach success in any phase of life. Honesty and loyalty are the cornerstones of any solid business organization. Every honest employer will always find employees who will follow him

To the last gasp, with truth and loyalty and will co-operate for the success of the enterprise.

The policy adopted by employers to democratize relations with employees cannot be always the same. Different methods are to be used in conformity with the place, production, preponderating nationalities and religious creeds, local customs, political conditions, and so forth. Therefore, prudence, care and wisdom are to be employed in adopting a particular policy especially in large concerns where the workers are composed of all elements coming from every corner of the earth.

Some Breeders of Labor Troubles

In my long experience in various industrial districts in different countries I have seen some large establishments which made the largest concessions and gave the greatest advantages to their employees, but notwithstanding this were always in trouble, having strike after strike. Interested by such an anomaly, I have tried to find out the reasons, and have discovered that the discontent has been caused generally by lack of tact, by intolerance on the part of the management, by partiality, or by special privileges given to individuals whose religion, nationality or political opinions suited better some manager. Some were large metallurgical concerns which established schools, churches, theaters and clubs for the benefit of the employees, but everywhere the regulations were so strict and the discipline so severe that all concessions, instead of being gratefully received, were a continuous source of discontent which reflected directly upon the daily routine in the shop.

The exceptional conditions of to-day are changing the course of business in general and of industrial life in particular. Although everywhere employers are giving all possible concessions to their employees, and religious and social organizations of every kind are trying to ameliorate the conditions of all workers, the latter, unfortunately, under the influence of unscrupulous demagogues, are inclined to dictate their own idealistic laws, which, if put into execution, would be more detrimental to themselves than to anybody else. The desire for higher wages and shorter working hours has already increased the cost of living to such a point that the subsistence of the workman is more difficult now than some years ago when his wages were very much less.

Needed Changes in Education

This is probably a consequence of an erroneous education given to our children. It is not taken into consideration that almost three-quarters of all pupils, boys and girls, belong to the working classes, and that they will be workers themselves. Many of the manifold subjects taught in our public schools are absolutely of no use to those who are obliged to go to work as soon as the law allows it, and in many cases before. I frequently have asked workers in various factories the simplest and most elementary questions, but have been unable to get an adequate answer, although my questions were a part of any primary school program. How much more profitable would it be, if in the schools frequented by the poorest classes, there was given to boys, as well as to girls, some knowledge, either of those trades and professions which are the most widespread throughout the country, or those suited to the needs of the particular locality. Good illustrative pictures, demonstrations, and the visiting of factories in working time would give an opportunity to many a child to grasp from his earliest years the kind of trade which suited him best, and would make him able, from the beginning, to start working in that special trade which had attracted him, without the loss of time and

the disappointments ordinarily incurred in going from one factory to another, trying different jobs.

By making the children of industrial workers acquainted with real factory life, by explaining to them clearly the relations connecting employers and employees, by teaching them the best way to conduct themselves in a shop toward the boss, as well as toward their fellow-workers, we would enable them to avoid many a difficulty, to form and develop their own opinions, so that they would distinguish what is good and what is bad, and would act when necessary of their own initiative, for their own best interest, without listening to the advice of the trouble-makers, who are constantly taking advantage of the inexperience and simplicity of the working people for their own low, selfish purposes. We would not then see so many youngsters who think that in roughness is democracy; in arrogance, courage; and in impudence, freedom.

The Labor Question the Great Question

Charles M. Schwab, president of the Bethlehem Steel Corporation, who knows better than most men in this country the real conditions in industrial life and all the perplexing questions concerning labor and laborers, having been a workman himself, lately said, or is quoted in the daily press as saying, that the time is near when the men of the working class will control the destinies of the world; also that in the very near future we must look to the worker for a solution of the great economic questions now being considered.

No one can foretell whether Mr. Schwab's prophecy that the workers will rule will ever come true, but we must not delude ourselves by failing to recognize that the labor question, as a consequence of the present gigantic struggle, is the great economic question of to-day. Who will be our future rulers, we do not know, but certainly we do not want to have in them a group of Bolsheviks, acting as they have done in Russia. If we want to forestall such a danger, or at least to mitigate it, only one way is open—to teach in our schools, to all our children, right ideas of justice, democracy and freedom; to impress on their minds, for the benefit of all their future, that these three essentials to the welfare of mankind cannot exist without individual and collective obedience and discipline. We must inculcate in our children the conviction that religion is the foundation of everything in life, whatever that religion may be, based on faith and stripped of prejudice. They must be also convinced that worship of God is fallacious if not followed by love, good morals, toleration, honesty and loyalty.

America, with her compulsory education laws, better than any other country in the world can do this. By molding the minds of her new generation she will prepare the new elements which will control not only her own destiny but the destinies of all mankind.

Let us not lose time, let us start to-day, for tomorrow will be too late.

Standardizing Trace Chains

In order to standardize the production of trace chains and thereby eliminate sizes which are not largely in demand, or the making of which reduces production, John C. Schmidt, Chief of Chain Section, War Industries Board, Washington, requests that no trace chains be made shorter than 10 links to the foot and that all trace, butt, stage and breast chains be made of a length no longer than 10 links to the foot. Mr. Schmidt was for 17 years president of the Standard Chain Co., York, Pa.

The monthly meeting of the Pittsburgh Foundrymen's Association was held in the rooms of the Americus Club in that city on Tuesday evening, May 20. L. A. Way, president, was in the chair, Frank B. Lounsberry, chief metallurgist of the Atlas Crucible Steel Co., Dunkirk, N. Y., read a paper on, "The Manufacture and Development of High Speed Tool Steel." The meeting was preceded by a dinner.

Aeroplane and Automobile Steels

Laying stress upon the necessity for exercising care in design in the selection of materials and above all in the heat treatment, Dr. W. H. Hatfield dealt with the constitution and properties of the steels employed in aeroplane and automobile engineering in a lecture delivered recently before the Birmingham Metallurgical Society (British). He pointed out that in the manufacture of cylinders, different manufacturers used no fewer than six different kinds of material. The special conditions that had to be met were fluctuations in tension and changes in temperature. He discussed several typical steels representing the materials available for automobile work, such as case-hardening steel, carbon steel, high tensile steel of the nickel-chromium type, air-hardening steel, rustless steel, high-nickel steel, and magnet steel. Practically all the alloys enumerated reach their critical points at different temperatures and, moreover, reach the state of solid solution at different temperatures, so that the treatment sufficient for one class of steel might be unsuitable for another.

One speaker in the discussion referred to the difference of opinion as to whether it was better to have a supersaturated case or a saturated case in case-hardening. In time past the former had been favored; but it was now considered unnecessary to have a supersaturated case, except where part of the work had to be ground off. Another urged the importance of normalizing specimens before subjecting them to heat treatment. Unless that were done it was useless to expect standard results, for the reason that materials were sometimes grossly misused in the early stages of production. Many of the ills that steel was heir to were due to improper treatment of the ingot in the first instance, and he counseled manufacturers to pay greater attention to the cooling of steel ingots when they came out of the molten state.

Dr. Hatfield, in his reply, said it was undesirable to have a supersaturated surface in case-hardening and that oil hardening gave better results than air hardening. One could also obtain better results from nickel-chromium than from carbon steel.

New High Explosives Plant

A new plant for the manufacture of high explosives for the United States Government will be erected in the Pittsburgh district within the next eight or ten weeks, at a reported cost of between \$2,000,000 and \$3,000,000, to replace that of the Aetna Chemical Co. at Oakdale, recently destroyed by explosions. The plant at Oakdale will be only partly rehabilitated and will be used for the treatment of spent acids from the other plants of the company. In the future no dangerous explosives will be handled at the Oakdale plant. A new site of from 50 to 100 acres is to be selected for the new plant. The United States Government has been asked to commandeer machinery, lumber, brick, steel and other material needed for the construction of the new plant.

Price Fixing in Canada

TORONTO, ONT., May 25.—The matter of fixing prices on iron and steel has been considered by the Canadian War Trade Board, but no action has yet been taken, the board finding that the matter presented much complexity and difficulty. The agreement to take over the output of new furnaces producing pig iron for a term of three years may lead the Government to go farther and fix the standard for this and other products, especially during the war period. As a general rule, iron and steel prices in the Dominion are well above those of the United States, in some cases working to the disadvantage of Canadian manufacturers.

The Fahnestock Mfg. Co., Avonmore, Pa., is erecting a 60-ft. addition to its steel foundry. The installation includes a 15-ton ladle crane, a 5-ton auxiliary hoist and a 10-ton cleaning-room crane, over a new annealing furnace.

YET HEAVIER LOADING OF CARS

Saving in 1917 by Steel Corporation and the Railroads

BY J. F. TOWNSEND*

There has been a marked improvement in transportation, especially at all the steel producing points, located in the Pittsburgh, Cleveland, Youngstown, Buffalo and Chicago districts, with the more favorable weather conditions; but with the opening of navigation on the Lakes, the demand for equipment to supply coal mines with cars for Lake coal will be increased, and the demand for a greater number of cars required to move the largest shipments of iron ore that the country has ever had makes it very plain to those in touch with the situation that there will be very little improvement in the car supply, unless shippers can be aroused to a full appreciation of this very serious problem and give their co-operation toward the utilization to the fullest capacity of all cars.

While there have been some great strides in the adoption of modern equipment of large capacity and improved methods for heavier loading of cars, the increased volume of traffic that the railroads are confronted with to-day has far exceeded their most advanced plans to provide adequate facilities for the natural increase in the general business, to say nothing of the abnormal volume of business that we have at present.

The railroads have grappled with the situation in a heroic manner, attempting to handle traffic that would be sufficient to support nearly double the number of railroads that we have to-day, or, at all events, double the facilities and rolling stock in the section of the country east of the Mississippi River; and if the shippers will do their part toward utilizing equipment to the fullest extent and consignees unload all cars promptly at destination, they will do more toward clearing up a very bad situation than by criticizing the overtaxed railroad men.

100-Ton Car Coming

Last year a new 85-ton hopper car was constructed by the Pennsylvania Railroad at its Altoona shops. With the 10 per cent allowed above capacity, this car will carry 187,000 lb., or 93.5 tons, and this really means that the 100-ton car will soon appear. It seems appalling to look at this huge car that will practically hold 100 tons of freight, when the records compiled show that the average carload throughout the United States is but 22.5 tons, or substantially one-fifth the capacity of this monster. It is a hopper car constructed with five drop doors, suitable for handling coarse freight, such as iron ore, coal, coke and limestone, all of which should be loaded to the full carrying capacity.

The Norfolk & Western has over 1700 200,000-lb. capacity steel gondola cars, with six-wheel trucks, that are in regular service and are giving satisfactory results.

The Virginian Railway has four 120 ton steel gondola cars that have been built during the last year for experimental purposes.

These changes show that the adoption of a car of 200,000 lb. capacity for coarse bulk freight is not only practical, but its general adoption would make for efficiency.

One Average of 88,300 Pounds in 1917

The 13 shipping companies of the United States Steel Corporation have conducted a vigorous campaign for the heavier loading of cars and during the year 1917 the average carload of these companies was 88,300 lb. per car. This is a remarkable showing, when it is taken into consideration that the average capacity per freight car in this country is only 80,000 lb., according to the statistics compiled by the Bureau of Railway Economics, and it is hard to realize this record of heavy loading when the average carload of all rail-

roads throughout the country on all traffic, including the steel traffic referred to, was only 44,800 lb. per loaded car, or an average of 43,500 lb. per car less than the record made by the shipping companies of the United States Steel Corporation.

Great Saving in Cars

While the 13 shipping companies referred to increased the average carload on outbound shipments during the year 1917 only 2900 lb. per car, there was an actual saving of 73,010 cars, as compared with the loading for the year 1916, when the average was 85,400 lb. per loaded car. This does not include the cars loaded by the Oliver Iron Mining Co. in shipping millions of tons of ore forwarded during the year, all of which were loaded to the average of 50 tons per car: to include these would have tended to increase the average load, but might have been considered misleading.

The saving, according to the basis used by the American Railway Association in its compilation of Feb. 6, 1917, places the average earnings of a freight car at least at \$2.50 a day; and using that method of calculation, i. e., multiplying 26,648,650, the number of idle car days, by these average earnings per day, shows that during the year 1917 the railroads have enjoyed a gain in gross earnings of \$66,621,625, on account of the heavier loading of cars. That effected a saving of 73,010 cars, for it means that these cars were in other service.

To put this the other way around, it means that the 13 shipping companies actually forwarded 3,223,391 more tons of traffic than if the practice of loading one year ago had been followed, and this increased traffic was enjoyed by the railroads without any additional operating expenses.

According to the Interstate Commerce reports compiled for the calendar year 1916, the average haul per ton of revenue freight throughout the country of the individual railroad was 166 miles and there were 25 loaded freight cars per train. On this basis the railroads throughout the United States were saved 12,119,660 car miles, or 484,786 train miles; the saving of 73,010 cars means that these cars were in other service and at the average freight revenue of 16.13c. the actual saving of the 73,010 fewer cars used resulted in increased earnings to the railroads of \$1,954,901.15 without any increased operating expenses.

Steel Corporation Saving

During the last six years the 13 shipping companies of the United States Steel Corporation have effected a saving of 275,908 cars through the heavier loading of equipment, a record probably unmatched in this country for the period referred to.

The shippers, consignees and the railroads themselves have been greatly benefited in the fewer number of cars switched and weighed, to say nothing of the relief of terminals and great saving in operating expenses that would have been created had it been necessary to handle this additional number of both empties and loads through the various classification and interchange yards of the railroads from point of shipment to destination.

This record proves conclusively the real value of conserving the freight car equipment at all times.

The United States Steel Co., Everett, Wash., W. J. Johnson, manager, has started construction of its plant, which will manufacture merchant steel and iron bars, channels, deformed and twisted, concrete reinforcing and special shapes. The main building of the plant will be 70 x 200 x 32 ft. Electric magnets will be installed. Most of the machinery for operation of the plant has been purchased.

The new electric furnace plant of the Electric Smelting Co. of Brantford, Ont., is being started at Hull, Que., making low phosphorus pig iron from scrap. The type of furnace used is not yet announced.

*Traffic manager National Tube Co., Pittsburgh.

Senate Votes for Premium Wage Payments

Stop Watch Prohibition in Naval Appropriation Bill Not Removed but Remainder of Rider Eliminated

WASHINGTON, May 28.—The champions in the Senate of scientific shop management in the manufacturing establishments of the Government as a means of speeding up war work won a notable though partial victory in the course of the debate on the annual naval appropriation bill during the past week. Although the Senate by a vote of 39 to 21 refused to strike out the rider attached by the Naval Committee forbidding the use of "the stop watch or other time-measuring device" for making "a time study of any job," it reversed the action taken annually during the past five years prohibiting the payment of premiums, bonuses or cash rewards in addition to regular wages. This prohibition was stricken from the bill by a vote of 37 to 31. Leaders of organized labor, who have planned and carried through the campaigns that have resulted in the attaching of anti-scientific management riders to the leading appropriation bills during the past three years, make no concealment of their disappointment at the Senate's action, but are already planning to bring pressure to bear upon the conference committee to restore the entire provision in the form in which it was enacted last year. Parliamentary difficulties will be encountered, however, and there is a fair prospect that the premium and bonus system may be approved in the appropriation act as finally passed.

An overwhelming majority of the Senators who discussed the Naval Committee's rider, opposed it vigorously and denounced in terms rarely employed with regard to labor in either house of Congress the conspiracy of the authors of the rider to put the Government of the United States at a great disadvantage in meeting the gravest emergency ever faced by this or any other Government.

A motion to strike out the entire provision was made by Senator Gallinger of New Hampshire, the venerable minority leader of the Senate, who has never failed to oppose this rider. A stirring appeal to the Senate to resist the temptation to cater to the so-called labor vote was made by Senator Thomas of Colorado, who declared that the rider was class legislation. "At the time this matter was first discussed upon the floor of the Senate," said he, "I was in receipt of many letters and one or two petitions from men working in the Government establishments protesting against the insertion of the provision, and giving as their reasons that they were not only satisfied with the policies which controlled and operated these institutions, but that they were enabled to earn added money, additional compensation, largely through piecework, and upon the assumption that their right to continue that class of work would not be interfered with many of them had purchased little homes upon the installment plan and were dependent upon their extra earnings to meet the installments as they should fall due."

"Every man upon the front must receive," he continued, "if we are to stand behind him as we must, 50 lb. of food, clothing, ammunition and equipment per day, or 9 tons per year. If we are to have there an army of a million men before the snow flies next November, as we have promised, that means that we must have 9,000,000 tons of shipping to be devoted to the sole purpose of supplying them with those things which are essential to their preservation. The Naval Committee in its wisdom has reported a bill here carrying for that purpose one and three-quarter billion dollars, a most stupendous sum. Yet that identical bill forbids the Government to pay 'premiums or bonus or cash reward to any employee, in addition to his regular wages, except for suggestions resulting in improvements or economy in the operation of any Government plant.'"

"We have established an 8-hr. day; we have pro-

vided for extra pay for overtime and double pay for work upon Sunday for the purpose of encouraging production. Yet the Government cannot under this provision pay one of its employees a dollar in excess of his actual pay for an 8-hr. day of labor."

Senator Tillman's Change of Attitude

Senator Tillman, chairman of the Naval Committee, which reported the rider, confessed he did not indorse it in its entirety and declared that he would be willing to vote to strike out the prohibition against the payment of premiums and bonuses. He asserted, however, that "no free man ought to be subjected to such an indignity as is involved in the use of the stop watch, which is for slaves and not for free white men." Under cross examination by Senator Gallinger, Senator Tillman admitted that he did not know of a single industrial establishment in the country where a stop watch was actually used on men at work, and he added that the term "stop watch" had probably been put into the bill through "pure cowardice," adding, "I may have voted for it at some time in the past, but then I was not myself."

Senator Townsend of Michigan strongly supported Senator Gallinger's amendment to strike out the rider. "The only argument that I have ever heard that was worth considering in opposition to this plan," said he, "is that it might possibly induce men to work harder than they ought to work; that men, anxious to obtain the additional compensation offered, might imperil their health or injure themselves by putting forth this extra effort; but there is no argument that can stand the light of logic against paying a man who does extra work, extra compensation. In this stressful time of emergency I am not so much disturbed over the possibility that men may work too hard as I am that they will work too little. More evil comes from idleness and slacking than from overwork."

Defense of the Prohibition

The chief defender of the rider was Senator Hollis of New Hampshire, who declared that he would not for a moment support it if he thought it would detract in any way from the ability of the Government to prepare for war or if it would decrease the per capita production of workmen in the long run. "The worst way to attempt to bring about efficiency," he said, "is to disrupt the channels that have already been plowed out in which labor may move as a mass."

Senator Swanson, ranking member of the Naval Committee, opposed the striking out of the rider on the ground that Secretary of the Navy Daniels was opposed to scientific shop management, but that nevertheless the navy had made an excellent record for preparation for the war. He called attention to the fact that a similar rider had been incorporated in the naval appropriation acts for the past three years and added: "Its continuation from year to year has not operated to prevent satisfactory ascertainment by other means of the operative efficiency of employees." In view of the Secretary's position Mr. Swanson appealed to the Senate not to change existing conditions or to "disarrange the matter, knowing nothing about how the experiment will result."

Senator Wadsworth of New York in a vigorous speech urged the Senate to do everything in its power to bring Government manufacturing establishments up to the standard of efficiency maintained in private plants. "I myself," he said, have seen machines operating in private munitions plants, employing the efforts of only one man, that do six times the amount of work that is done by a similar machine in a Government arsenal employing the efforts of one man. It is

because the private munition plant has been able from time to time to make experiments, and in making those experiments to use time-measuring devices in measuring the efforts that are necessary to be put forth by the workman and in measuring what can be saved in the way of effort by that same workman—it is by reason of that privilege, which private plants have, that they vastly excel, in many instances, in their efficiency anything that any Government machine shop achieved."

Senator Underwood of Alabama, himself a manufacturer, said that "this question of putting labor continually, in the passage of these bills, between the accomplishment of efficiency and the accomplishment of victory for our country, is the greatest libel and the greatest slander that has ever been laid at the door of American labor." Senator Underwood suggested an ingenious interpretation of Secretary Daniels's letter, offering the explanation that the Navy Department, while living up to the letter of the prohibition against the use of the stop watch, had employed other scientific shop management methods to the same general end.

Senator Harding of Ohio dwelt on the important department in leading universities to-day, namely, that of efficiency engineering. Referring to the fact that gangs of riveters have driven approximately 5000 rivets in one day to win prizes, he said that he did not contend that the average American workmen, constituting a gang of three, should drive even 1200 rivets a day and certainly not 4000 or 5000, but he did insist that when it had been demonstrated that 5000 could be driven it

was a reasonable proposition that an efficient gang of workmen should drive 500 instead of 120 to 240, which were being driven in many of our shipyards where there was no bonus to spur the men on.

Acting on Rider in Two Parts

At the suggestion of Senator Borah of Idaho the pending rider was divided into two parts and a vote was first taken on that portion forbidding the use of the stop watch or other time-measuring device. This ballot resulted in the retention of the provision as previously stated. Senator Gallinger then offered a second amendment striking out the prohibition against the payment of premiums or bonuses. Senator Harding suggested that it would be difficult to secure a basis for the payment of bonuses without the adoption of fundamental efficiency methods to determine standards, but Senator Gallinger expressed his belief that, while the prohibition against the use of the stop watch was to be regretted, other methods would be found for introducing efficiency systems that would provide a basis for the payment of premiums. Senator Gallinger's second amendment was thereupon adopted.

The naval bill as finally passed by the Senate carries, \$1,610,000,000, an increase of about \$226,000,000 over the measure as passed by the House. Construction of superdreadnaughts and battle cruisers, provided for in 1916, has been held in abeyance with a view to increasing the facilities for building destroyers to meet the submarine menace, but the present bill provides that work shall be started as soon as practicable on the 150 ships provided for in the three-year program.

Power and Hand Feed Milling Machine

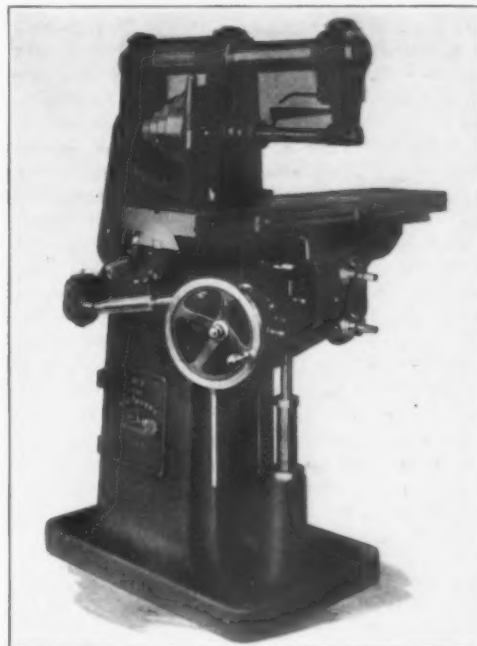
A milling machine, which in addition to the ordinary power feed is equipped with both lever and wheel controlled hand feeds, has been brought out by the Davenport Mfg. Co., Meadville, Pa. In connection with this triple feed arrangement, specially designed automatic trips are provided which will throw out the power feed and leave either one of the hand feeds connected to the table motion as desired. The feed screws for the transverse and vertical movements have adjustable graduated dials for gaging the depth of cut and the elevating screw is of the telescopic type, thus doing away with the necessity of cutting a hole through the floor.

The table which has a working surface measuring $9\frac{1}{4} \times 36$ in., has three $\frac{3}{8}$ -in. T-slots cut in the upper surface with an oil groove on the sides and oil pockets at the ends. The maximum dimensions of work that can be handled are 22 in. in length, $6\frac{1}{2}$ in. wide and 19 in. high.

The power feed for the table is obtained through a chain driven feedbox providing for six rates ranging from 0.003 to 0.016 in. per revolution of the cutter spindle. All the changes are obtained through two levers and can be made while the machine is in operation. The feed change mechanism is driven by a roller chain and is contained in a single unit which is placed in the column at some distance above the floor. A single large oil pocket which can be filled through an opening in the column provides lubrication for all parts of the mechanism. The feed is reversed by a push rod on the feedbox. Automatic trips are provided which can be set to operate at any point of the table motion and leave either the hand lever or the handwheel connected to the table motion, as may be desired. The hand feed to the table is obtained through a hand lever which traverses the table 5 in. for one full movement of the lever, or through a handwheel which gives a motion of $\frac{1}{4}$ in. for each complete revolution. It is pointed out that the lever is made very long and may be set at a point which is most convenient for the operator, or may be disengaged entirely by a spring plunger. For the convenience of the operator the handwheel is located at an angle with the apron. All three of the feeds are available in either direction.

The machine is driven by a $2\frac{1}{4}$ -in. double belt running over a four-step cone pulley, the diameter of the steps ranging from 5 to $10\frac{1}{4}$ in. The spindle which is $2\frac{1}{2}$ in. in diameter in the front bearing is of crucible

steel and runs in bronze boxes having an adjustment for wear. Speed changes to the number of eight ranging from 65 to 367 r.p.m. are provided. The lubrication



A Chain Driven Feedbox Provides Six Changes of Power Feed While Coarse and Fine Hand Feeds Are Secured Through a Lever and Hand-wheel Respectively

of the spindle is accomplished through wicks which are supplied with oil from annular pockets cast around the bearings. The level of the oil in these pockets is shown by glass indicators.

A 22,000-kw. turbo-generator set has been ordered by the United Electric Light & Power Co. of New York City, of the Westinghouse Electric & Mfg. Co. The generator will be rated at 25,900 kva., at 85 per cent power factor, 8000 volts, 3-phase, $62\frac{1}{2}$ cycles. It will be direct-connected to a Westinghouse turbine. The order includes a 40,000-sq. ft. surface condenser.

Scrap Dealers Pledge Their Loyal Support

W. Vernon Phillips, Chairman of Sub-Committee of American Iron and Steel Institute, and President Shroder Make Patriotic Addresses at Pittsburgh Meeting

At the meeting of the American Board of Scrap Iron Dealers in Pittsburgh, May 22, resolutions were adopted reciting that the board recognizes the importance of maximum shipments of scrap iron and steel in order to obtain the maximum production of steel and iron products required by the Government, pledging the loyal and unmeasured support to the Government for the successful prosecution of the war and urging all members to pledge themselves in writing to the prompt compliance with and performance of the pledge embodied in the resolution.

William J. Shroder, president of the board, spoke at length and very earnestly on the subject of scrap dealers co-operating with the Government. He said that matters of prices should be subordinated and that the one direct interest of all dealers should be in securing maximum shipments of all forms of scrap.

W. Vernon Phillips, chairman of the Sub-Committee on Scrap Iron and Steel of the American Iron and Steel Institute, delivered an address which was enthusiastically received. He said:

Mr. Phillips' Speech

"As many of you do not quite understand, I first want to explain to you just what sort of an official I am, for legally I am no official at all—though I have all of the power of the Administration behind me.

"Mr. Baruch is responsible to the President for the proper operation of practically all industry. Mr. Replogle is responsible as Director of Steel Supply to Mr. Baruch and the War Industries Board. In their wisdom they have decided that men in the industries can run those industries more efficiently than the Government. So when Judge Gary offered the facilities of the iron and steel industries to them for this purpose it was accepted, and a committee of the ablest men in the steel industry chosen to assist him, known as the Committee on Steel and Steel Products. Judge Gary then appointed as chairman of various sub-committees men capable of handling the various parts of the industry.

"The Committee on Scrap Iron and Steel had such a varied problem that it was found necessary to appoint on this committee men representing the various industries interested so that our committee to-day is not only representative of the scrap dealers, but also has as advisers some of the most experienced users of scrap in its several branches, and it is never necessary for the chairman to go beyond the members of his own committee to get the best technical advice.

"The first problem of this committee was a readjustment of the price schedules, and while it is not perfect, and may at some time be subject to revision, we are proud of it to-day, and when looked at from a national standpoint it has been remarkably good. Many people complain because in their particular section it does not quite fit local conditions, but they should bear in mind that this must fit the entire United States, and it is a rare day that the chairman does not receive communications from every part of the country from Maine to Florida and from New York to San Francisco—in fact, the Pacific Coast has kept us quite busy of late, and not forgetting Washington. So while criticism may and will be made, we prefer to have all in writing for proper consideration.

Violation of Fixed Prices

"Now a word in regard to fixed prices and their violation. Anyone can cheat—it's the easiest thing in the world, particularly when you are put upon your honor, but can you imagine anyone meaner or more to be despised than a man who would do it under

existing conditions? I sincerely hope that the few dealers of this class will not apply for membership, or if members, will resign. It would be a proud day for me if I could say that the army of the American Board stood by its guns to the finish, and that none of them ever dragged its standard in disgrace.

"Some say it takes two to make an infraction. That is a very poor excuse. It is the dealer in potash who is supposed to know the maximum prices, not you when you go to buy it. It is the dealer in coal whom you believe when he tells you the price is thus or so—and it is the dealer in scrap who is supposed to know, and it is the dealer who will be held principally responsible for any violation. It is a child's excuse to say that the consumer or producer induced you to go wrong. You know, or you ought to know, and it is your duty to very quickly find out if you don't know.

"Our next big problem will be the procurement of sufficient scrap, and it is here that the American Board of Scrap Iron Dealers will have an opportunity to show whether it means what it says in its constitution, and when that time comes the Government is very likely to come to you as an organization (at least if I continue in charge), and ask you to constitute yourselves into an industrial army for the purpose of bringing every last ton of scrap to the markets, not for profit, but as soldiers doing a duty, helping to save your country, to build ships, to make guns, to make shells, to make stretchers and hospital cots, yes even to make crutches for the boys we are sending over. An order is being given this week for 750,000 cots for wounded men—think of it—750,000—and every pound of those cots is going to be made from scrap. I know for I have been asked to see that the mill is supplied properly.

"Gentlemen, when one talks profits and rights and privileges under such conditions, it leaves a bad taste in the mouth.

"The Government wants everybody to make a profit because it wants all to keep on working—working as hard as they can. Nearly one-third of the steel in the country is made from scrap, and while a lot of the scrap would reach the markets without the aid of the dealer, the portion that would not get there would be sufficient to upset the entire war program; in fact, a large number of the mills would very quickly be shut down. This is not said for the purpose of showing how important you are, but what a great duty and privilege you have, and you should all be thankful to feel that in doing your normal work you are helping to win.

The Most Important Service

"There is no great honor in buying a couple of thousand tons from some large manufacturer or railroad and selling to a consumer. It is helpful and no doubt assists both the producer and consumer, but it would get there anyhow. It is the man that actually locates material, prepares it, and delivers it to a mill that is actually serving and helping the country. Every ton of material reclaimed that would not otherwise be available is a step toward victory and peace, and this carries us down to the smallest collector.

"Some of the theorists are trying to start with the peddler and householder, but if the chairman of this committee finds it necessary, and is still empowered to do so, he will start with your splendid organization and work right down through you to every point of origin—that is the future of the American Board of Scrap Iron Dealers as we now see it—a powerful, efficient army properly generated and captained to keep the furnaces going to the limit of the scrap possibilities.

"Some of you may still stick to old thoughts, old ways and chafe against the arbitrary methods now in

force, but, gentlemen, we found after we got into this war that it was not only a question of preparing ourselves, but of immediately helping our Allies, and while we would have liked to proceed in an orderly way, we have been prevented from doing so by their dire necessity, and their cry of hurry, hurry, hurry. So everything has been put on an artificial basis; maximum prices are not natural; commissions are not natural; nothing is or can be natural until we have completed our great task. We are told what to do, and how to do it; freedom of action and, to some extent, freedom of thought has been temporarily taken away from us. Our superiors are responsible and we must obey their orders. You are soldiers and I am a soldier, and when I find it necessary to be harsh or arbitrary, remember it is as an officer, not as an individual. I have undertaken a great task; greater than anyone outside the scrap business has any conception of, but you, my friends know, and it is to you I must look for success or failure, and it is to you I look fearlessly and confidently. I believe there is no more loyal or patriotic set of men in the country than the scrap dealers. I have, of course, had trouble with some, but so far have been able to adjust all difficulties, and I can say with all honesty that not the large majority, but almost all of you have shown such a fine spirit of sacrifice and loyal intention that I look

forward with confidence to handling this difficult business successfully and within the industry.

"Let us prove that we can manage better than some of our great neighbors by not being taken over, and now permit me to thank you for the whole-hearted support you have given me, and beg not only a continuation of it, but your enthusiastic, warlike support, such as will put the scrap business on a pinnacle, and everlastingly stamp it as an industry that could and did do its duty when put to the acid test."

The attendance at the meeting was large, more than 100 representative scrap dealers from all over the country being present. The election of officers resulted as follows: Wm. J. Schroder of Jos. Joseph & Bros. Co., Cincinnati, president; Samuel Deutsch, Cleveland, vice-president; Charles A. Barnes, Philadelphia, secretary and treasurer. Directors were elected as follows: Joseph Michaels, of the Hyman-Michaels Co., Chicago; Harry S. Grant of the Grant Iron & Metal Co., Detroit; A. J. Bialosky of the Bialosky Brothers Co., Cleveland; Henry P. Rees, of E. Dreifus & Co., Philadelphia; Eli Joseph of Jos. Joseph & Bros. Co., Charles Dreifus of C. Dreifus Co., Pittsburgh, and W. Vernon Phillips, Philadelphia. D. R. Cohen is chairman of the Western Division; A. J. Bialosky, Cleveland, of the Central Division, and W. Perry E. Hitner, Philadelphia, of the Eastern Division.

SCREW THREAD STANDARDS

House Passes Bill Looking to Establish a Commission on Tolerances

WASHINGTON, May 26.—The Tilson bill providing for the appointment of a commission to standardize screw threads has been passed by the House of Representatives after a spirited debate in which the scope of the measure was made clear by its author, who described in detail its effect upon the manufacturing operations of the Government and upon those of private establishments. As the bill is regarded as a war measure of much importance the Senate Committee on Standards, Weights and Measures is being urged to make a favorable report at the earliest practicable date and its final passage this session is confidently predicted.

The bill as passed creates a body to be known as the Commission on the Standardization of Screw Threads to be composed of five members, including the director of the Bureau of Standards, a commissioned officer of the army and one of the navy and two civilians, one of whom shall be nominated by the American Society of Mechanical Engineers and the other by the Society of Automotive Engineers. The commission will be charged with the duty of establishing standards for screw threads, which, after approval by the Secretaries of War, the Navy and Commerce, "shall be adopted and used in the several manufacturing plants under the control of the War and Navy Departments and so far as practicable in all specifications for screw threads in proposals for manufactures, parts of materials to be used under the direction of these departments." The work of the commission must be completed within one year from the date of its appointment.

In urging the passage of the bill, its author, Representative Tilson of Connecticut, drew attention to the fact that at the present time the daily output of screws in the United States, exclusive of wood screws, is over 100,000,000 and that a number of different standards for threads have been established here as well as in foreign countries. No previous attempt has been made to establish a general standard of tolerances for screw threads and this is the work it is intended that the commission will take up and accomplish. Mr. Tilson pointed out that nearly every machine, whether large or small, is assembled by means of screws and that most of the adjustments of measuring devices, tools and machines, some of them very fine and delicate are made by means of screws. For a number of years the subject of screw thread tolerance has been under discussion by engineers and manufacturers of articles of metal, and the present bill is the outgrowth of an ef-

fort on the part of several engineering societies, certain manufacturers of screws, and many users thereof to adopt standards of tolerance.

General Adoption by Manufacturers

Replying to questions as to how the standards are to be put into use among the manufacturers of the country, Mr. Tilson said the Secretary of Commerce would print and promulgate the standards and that thereafter they would be used in the arsenals and navy yards and wherever practicable put into the specifications of Government contracts. So far as private manufacturers are concerned the new standards will not be compulsory except as to Government work they may do, but as they are eager to have standards officially adopted there is no doubt that manufacturers generally will take up the new system and that in a short time it will become universal. Although the present bill has been pending for more than two years Mr. Tilson said not one manufacturer has protested its passage.

Illustrating the present condition of screw production, Mr. Tilson exhibited to the House a chart made up of screws taken from twenty-six different hardware stores and which were supposed to be exactly the same size and description. The chart showed marked variations, some being so wide that the taps would not go on the screws at all while in other cases they were so loose that they would easily spin the entire length of the screw.

Several inquiries were made as to whether the proposed standardization would in any way be based upon the metric system, to which Mr. Tilson replied that the work of the commission would be to fix tolerances rather than standards. Standards, he said, would have to embrace both the metric and English systems to meet present manufacturing methods.

Reference was made in the debate to the difficulty experienced by the Government during the past year in obtaining dies, jigs, automatics, etc., for the manufacture of ordnance and the question was asked as to whether the proposed standardization of screws would not make further draft upon the producers of these devices. Mr. Tilson replied that the committee discussed that phase of the subject at length with engineers and manufacturers and became convinced that there was no danger of embarrassment on that account. "Cutting tools wear out very rapidly," said he, "and require to be replaced very often. The tooling up of a manufacturing concern must be done over and over again at short intervals and as soon as the standards are fixed all of the new tools will be made according to the new system and in a short time the transition will take place without embarrassment or hardship to any interest."

The Most Economical Production Lot

Formulas for Exact and Approximate Evaluation—Handling Cost of Jigs and Interest Charges of Product Manufactured Included

BY E. W. TAFT*

MANY industrial plants manufacturing diversified products or components of completed products which are stocked against future orders are able to fabricate more than one of these products or components on the same machine or machines, at different times, by means of interchangeable jigs, fixtures and tools. Included in this type of industrial plants are such enterprises as automobile, munition and machine tool and small tool factories, mills for producing various kinds of fabrics, plants producing power equipment, etc.

It is evident that the use of the same machine for different operations permits of a considerably lower investment in machinery and machinery equipment than would otherwise be the case; but on the other hand it requires a higher investment in stock of completely or partly processed products,

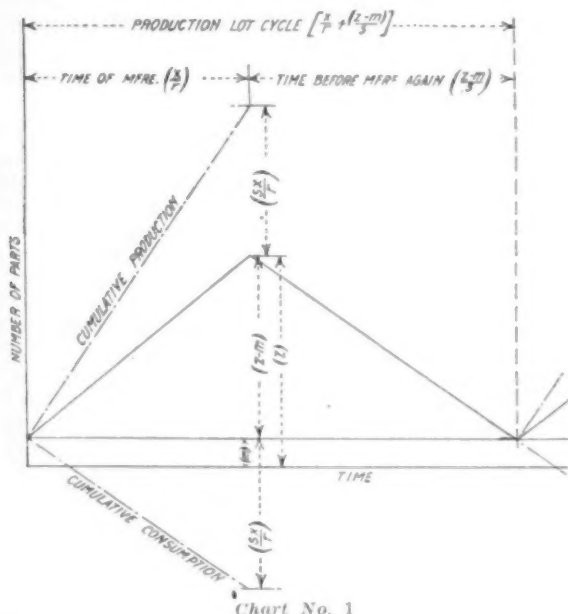


Chart No. 1

and consequently a larger storage space, and necessitates, when once a set of jigs, fixtures and tools has been adjusted for a particular component, a production of that component in excess of the contemporary sales requirements, in order that the machines to which the jigs, fixtures and tools have been adjusted may be released for future production of other components. An accumulation of components or products is thus obtained for which the company has expended money and on whose value it must pay interest.

It is apparent from the foregoing that there must be some one particular size of lot which is the most economical to produce. This lot evidently is that one in which the cost per unit is the least. For the purpose of determining the most economical lot the unit cost may be analyzed into three parts as follows:

1. A constant cost (as far as the economical lot is concerned) consisting of:
 - a. Direct labor.
 - b. Direct material.

c. That part of the overhead or burden which is not affected by a change in the stock of components or products, by the rental cost of the storage space, nor by the cost of adjusting the jigs, fixtures and tools for operation and the removal of them after operation (including the value of the lost machine time, additional scrap produced, etc.)

2. A variable cost caused by the interest on the surplus stock and the rental cost of the storage space due to the method of manufacture. (In general the rental cost of the storage space may be neglected because of its comparatively small value.)
3. A variable cost caused by the adjusting of jigs, fixtures and tools for operation and the removal after operation (including the value of the lost machine time, additional scrap produced, etc.)

The least unit cost then is obtained when the sum of the two variable costs is a minimum.

Following is the derivation of a general production formula for evaluating the most economical lot.

Definition of symbols used in the derivation:

A = the total adjusting and removal cost in dollars. This includes:

- a. Direct labor for adjusting the jigs, fixtures and tools, and removal of them.
- b. Supervisory labor for a.
- c. Value of the idle machine time during the adjusting and removal period.
- d. Value of machine time that is not made full use of in getting the production up to a rate r .
- e. Value of parts scrapped and tools broken in adjusting.
- f. Value of the increased labor cost per part multiplied by the number of parts produced up to the time that the rate r is reached, over the labor cost on an equal number of parts after the rate r is reached. (This in general is the difference caused by the employee being on a day work basis until the parts are being produced with sufficient rapidity to allow of his being paid on a piece work basis.)

c = The unit cost in dollars.

D = The constant part of c . (For this discussion.)

i = The interest rate in per cent that is to be charged on the parts in stock over and above the necessary minimum.

m = The minimum number of finished parts allowed as a reserve or safety factor.

r = The production rate in number of parts per year. This is the rate that can be maintained after the adjusting of jigs, fixtures and tools is completed.

s = The consumption rate in number of parts per year. (Generally the shipment rate for products and the assembly rate for components.)

x = The most economical number of parts to process. (The size of the most economical production lot.)

y = The most economical, adjusting and removal unit cost.

z = The number of parts in stock when the processing of any lot is stopped.

Derivation of formula.

$$y = \frac{A}{x} \quad (\text{From definition}) \dots \dots \dots (1)$$

$$\frac{z-m}{s} + \frac{x}{r} = \text{Time of storage (years). See chart No. 1.}$$

$$\frac{z-m}{2} = \text{Average number of parts in stock upon which interest is to be charged. See chart No. 1.}$$

$$ci \left(\frac{z-m}{2} \right) \left[\left(\frac{z-m}{s} \right) + \frac{x}{r} \right] = \text{Interest charge (total).}$$

$$\text{But } z = x + m - \frac{sx}{r} \text{ or } z - m = \frac{xr - sx}{r} = \frac{x(r-s)}{r}$$

$$\therefore ci \left[\frac{x(r-s)}{2r} \right] \left[\left(\frac{x(r-s)}{rs} \right) + \frac{x}{r} \right] = \text{Interest charge (total).}$$

$$\frac{ci}{x} \left[\frac{x(r-s)}{2r} \right] \left[\left(\frac{x(r-s)}{rs} \right) + \frac{x}{r} \right] = \text{Interest charge per part.}$$

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or $\frac{ci}{x} \left[\frac{x(r-s)}{2r} \right] \left[\frac{x(r-s+s)}{rs} \right] = \text{Interest charge per part.}$
or $\frac{ci x^2}{x} \left[\frac{(r-s)}{2r} \right] \frac{1}{s} = \text{Interest charge per part.}$
or $\frac{ci x (r-s)}{2rs} = \text{Interest charge per part.} \dots \dots \dots (2)$
 $c = D + \frac{A}{x} + \frac{ci x (r-s)}{2rs}$ (by definition) $\dots \dots \dots (3)$
Let $\frac{i(r-s)}{2rs} = K$
Then $c = D + \frac{A}{x} + Kcx$
 $c(1-Kx) = D + \frac{A}{x}$
 $c = \frac{D}{(1-Kx)} + \frac{A}{x(1-Kx)}$

Now finding the first derivative of c with respect to x we have
 $\frac{dc}{dx} = \frac{DK}{(1-Kx)^2} - \frac{A}{x^2(1-Kx)^2} \dots \dots \dots (4)$

Putting this first derivative equal to 0 and solving for x we have

$\frac{DK}{(1-Kx)^2} - \frac{A}{x^2(1-Kx)^2} = 0$
 $\frac{DK}{(1-Kx)^2} = \frac{A}{x^2(1-Kx)^2}$
 $DKx^2 = A - 2AKx$
 $x^2 + 2 \frac{Ax}{D} = \frac{A}{DK}$
 $x^2 + \frac{2Ax}{D} + \left(\frac{A}{D}\right)^2 = \frac{A}{DK} + \left(\frac{A}{D}\right)^2$
 $\left(x + \frac{A}{D}\right)^2 = \frac{A}{DK} + \left(\frac{A}{D}\right)^2$
 $x + \frac{A}{D} = \sqrt{\frac{A}{DK} + \left(\frac{A}{D}\right)^2}$
 $x = -\frac{A}{D} + \sqrt{\left(\frac{A}{D}\right)^2 + \frac{A}{DK}}$
 $x = -\frac{A}{D} + \sqrt{\left(\frac{A}{D}\right)^2 + \frac{2Ars}{iD(r-s)}}$ (Substituting $\frac{i(r-s)}{2rs}$ for K)

Now if x be given a value a little less than this and substituted in (4), $\frac{dc}{dx}$ will be negative. And if x be given a value a little more than this and substituted in (4), $\frac{dc}{dx}$ will be positive. Therefore the value of

$x = -\frac{A}{D} + \sqrt{\left(\frac{A}{D}\right)^2 + \frac{2Ars}{iD(r-s)}}$

is the one which gives the least cost per part, " c ", and is the size of the most economical lot.

The above formula, while mathematically exact, is somewhat complicated and cannot be solved by means of a slide rule. An approximate formula may be obtained by the following reasoning:

As stated before, the minimum unit cost is obtained when the sum of the adjusting and removal unit cost $\left(\frac{A}{x}\right)$ and the interest unit cost $\left(\frac{ci x (r-s)}{2rs}\right)$ is a minimum. Examination of these two factors shows that the variables in each are respectively x , and c and x . A considerable fluctuation in the value of c in the factor $\left(\frac{ci x (r-s)}{2rs}\right)$ would have

little effect in the total unit cost. Suppose then that a constant value for c in this factor be arbitrarily assigned and let it be denoted by C . This

could well be the unit cost for the last lot processed. The only variable now left in either factor is x .

Then $c = D + \frac{A}{x} + \frac{Cix(r-s)}{2rs}$ (approximately)

We now wish to find a value of x which will make c a minimum. First then differentiate c with respect to x

$\frac{dc}{dx} = -\frac{A}{x^2} + \frac{Ci(r-s)}{2rs} \dots \dots \dots (5)$

Putting this first derivative = 0 and solving for x we have

$\frac{A}{x^2} = \frac{Ci(r-s)}{2rs}$
 $x^2 = \frac{2Ars}{Ci(r-s)}$
 $x = \sqrt{\frac{2Ars}{Ci(r-s)}}$

Now if x be given a value a little less than this and substituted in (5), $\frac{dc}{dx}$ will be negative. And if x be given a value a little more than this and substituted in (5), $\frac{dc}{dx}$ will be positive.

Therefore the value of $x = \sqrt{\frac{2Ars}{Ci(r-s)}}$ is the

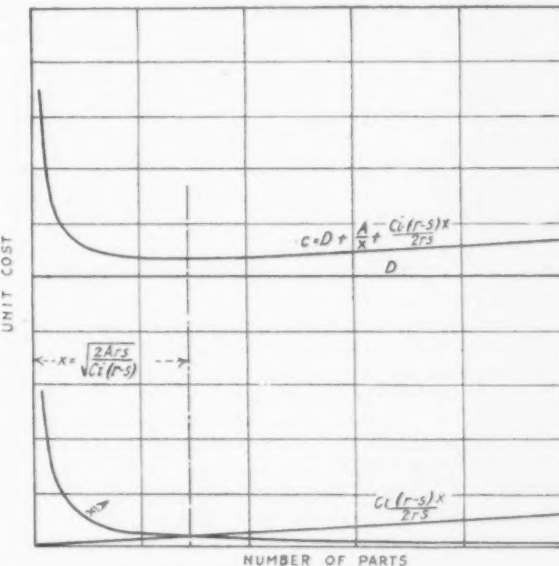


Chart No. 2

one which gives the least value for c and is the size of the most economical lot.

Let us now compare the formulæ arrived at by the two methods, viz.,

$x = \sqrt{\left(\frac{A}{D}\right)^2 + \frac{2Ars}{Di(r-s)}} - \frac{A}{D}$ (exact)
 $x = \sqrt{\frac{2Ars}{Ci(r-s)}}$ (approx.)

A similarity is at once apparent and in practice the results are even closer than the appearance would indicate, since in general the value of $\frac{A}{D}$ is small compared to $\frac{2Ars}{Di(r-s)}$ and since in every case C being greater than D the value of $\frac{2Ars}{Ci(r-s)}$ is less than $\frac{2Ars}{Di(r-s)}$ and this more or less com-

pensates in the approximate formula for the subtraction of $\frac{A}{D}$ in the exact formula.

Because of the above, and since in either formula the exactness of the solution depends on an *estimate* of consumption per year which in itself is undoubtedly not exact, and since the approximate formula is easily used with a slide rule, and since each use of the approximate formula gives us a value of c nearer the minimum than the previous one, it is, practically, preferable to use the approximate formula.

Chart No. 2 presents, graphically, the equation representing the approximate production formula and the equations representing the three parts of the unit cost. The number of parts in the production lot is plotted horizontally and the unit cost vertically. From this chart it will be seen that the constant part of the unit cost (D) is represented by a straight line parallel to the horizontal axis, that the unit adjusting and removal cost $\left(\frac{A}{x}\right)$ is represented by an equilateral hyperbola, and that the unit interest cost $\left[\frac{Ci(r-s)x}{2rs}\right]$ is a straight line passing through zero.

The chart shows graphically that the least unit cost is found with that number of parts which is the abscissa of the point of intersection of the curves of unit interest cost and of unit adjusting and removal cost. This may also be demonstrated mathematically. It will also be noted that the unit cost increases at a lesser rate as the number of parts in the lot increases over the number for the least unit cost than it does as the number of parts in the lot decreases below the number for the least unit cost.

Using Low-Grade Minerals in Germany

The forced use of some raw materials in Germany which were considered too poor in peace times has been resorted to, according to *Stahl und Eisen*. This has been caused by the stoppage of imports or the advance in prices in Germany, due to the war. In several cases sufficient success has been obtained by new methods to justify the working of low-grade ores even in normal times. Thus, copper schists were hardly utilized when they contained only 2.5 per cent copper. Now ores of 1 per cent and even 0.7 per cent find utilization. As regards iron and steel there has not been much change, but poor pyrites and phosphatic ores are no longer rejected. The vanadium for steel is found in sufficient bulk in slags which do not contain more than 0.7 per cent vanadium; the wolframite of old waste heaps is a raw material for tungsten; chrome ore of 24 per cent is welcome—half the percentage formerly deemed worth mining—and sources of nickel are worked if they contain 1.5 per cent of nickel. Bauxite of 40 per cent aluminum is considered sufficiently rich. It is also stated that, after all, the aluminum can be got out of clay. There is no change as to arsenic and antimony. Sulphur, no longer obtainable as such, is gained from gypsum and anhydrite, and phosphates of 20 per cent are converted into fertilizer.

A syndicate in which the Universal Rolling Mill Co., Bridgeville, Pa., owns the controlling interest, has purchased the works of the Hussey-Binns Shovel Co., Charleroi, Pa., former manufacturer of shovels. The price is said to have been \$500,000 and covers the investment of stockholders of the company, which recently entered proceedings in voluntary receivership. All obligations have been satisfied. The plant will be operated as a separate unit by the management of the Universal Rolling Mill Co. under the name of the Hussey-Binns Steel Co., of which the president is Walter H. Baker, secretary and treasurer of the Universal company.

Standardization of Allied Airplane Design.

Satisfactory progress in the standardization and development of Allied airplane design is reported by the American Aircraft Commission, which spent several weeks in Europe recently in conference with engineering representatives of the Allies. The prime objects of the conferences were to facilitate the sending of most usable supplies to England, France and Italy from the United States and to settle mutually satisfactory standards and specifications; to make parts, fittings and instruments interchangeable on aircraft produced in the different countries.

Progress was made, according to Coker F. Clarkson, general manager Society of Automotive Engineers, in the formulation of Allied standard specifications for aircraft steels, based upon current American, British, French and Italian specifications; covering both the general procedure for testing and the chemical and physical requirements of wrought steels.

The situation in other important details is analyzed as follows:

In the metric sizes the S. A. E. and the British ball-bearing series are identical, except that six S. A. E. sizes have not been included in the British list. A revision of tolerances and limits recommended by the British and the American delegates is under consideration. Limits of eccentricity in radial bearings and outside dimensions of thrust bearings were other subjects of study.

International Unification of Threads

The plan, provisionally adopted by the sub-committee of the International Commission on Pipe Threads, which met in Paris, July, 1914, for a standard method of designating units of construction, was discussed, with reference particularly to screw threads and gear-wheel teeth, the idea being to seek a unit which could be used when either the inch or the metric system is employed. Taking screw threads as an illustration, a system of notation was outlined by which each screw would bear a distinctive number based on the diameter in eighths of an inch, and the pitch in the number of threads per inch or per 127 mm. (which equal 5 in.), without reference to the unit in which the measurement might be made. For example, a $\frac{3}{4}$ -in. U. S. standard bolt having 10 threads per in. would be designated a "6 x 50" bolt in countries using the metric system. The selection of 127 mm. as the length over which the number of threads should be stated in countries using the metric system is based on the fact that this gives whole number of turns, these being five times the number of threads per in.

Co-ordination of water and fuel piping standards is largely dependent on thread practice. The use of outside dimension only for nominal diameters of metal tubing has been recommended by the British and the American committees.

The British and American practice in wheels and tires are substantially in accord. Discussion is being had as to the advisability of extending the list of wheel sizes which has been adopted here.

The British and the American steel wire cables are sufficiently alike to be practically interchangeable. The same thing is true of high-tension steel wire.

It is felt that similarity of design is not necessary in turnbuckles, satisfactory interchangeability being securable if the fork-end and pin dimensions are standardized.

The single aim in considering the various matters is to ascertain to what extent we can, without interfering with our productive capacity, adopt European standards with advantage; to what extent we can assist more effectively in cases of European conformity with our practices; following the course that will bring the best results. That which does not contribute to the winning of the war is of quite secondary importance. Anything that does contribute to the winning of the war is obviously of prime importance.

The offices of the McVoy Sheet & Tin Plate Co., have been removed to 625-626 Henry W. Oliver Building, Pittsburgh.

WORLD'S IRON-ORE RESERVES

Mining Engineers Discuss Their Relation to Post-War Economic Conditions

"Iron-Ore Resources of the World in Relation to National Economic Conditions After the War" was the subject of an important meeting of the New York Section of the American Institute of Mining Engineers at the Machinery Club, Thursday evening, May 23. J. E. Johnson, Jr., was the chairman. In introducing the subject of the evening he emphasized its importance with reference to the final peace conference and the future peace of the world. The iron-ore reserves and output of the principal ore fields of the world were briefly discussed by prominent mineralogists and engineers.

E. C. Harder, of the U. S. Geological Survey, read a short paper on the iron-ore deposits of Brazil. He drew attention to the fact that before the war capital was becoming interested in the Brazilian deposits which consist of five great fields, the largest containing probably 500,000,000 tons. He believed that they will play an important rôle in the world's steel industry, despite their unfavorable location. It does not seem likely that they can be smelted in Brazil because of the dearth of coal. Most of the probable output of 10,000,000 tons per year will go to England, because the ores are suited to the British acid Bessemer process, but some will make up for the United States the decrease in domestic Bessemer ores. THE IRON AGE of Oct. 15, 1914, contained an important article on these ores by Mr. Harder.

Prof. W. W. Lindgren of the Massachusetts Institute of Technology, Boston, discussed the deposits of Scandinavia. The Swedish ores have long been known for their high quality. They consist of three groups, the southern being the best known, but having small reserves. The second group is that of central Sweden, which to the world as a whole is of no particular interest. The important group is that of Lapland in northern Sweden, with an ore reserve of some 1,200,000,000 tons, and in which are the famous Kiruna mines, credited with 760,000,000 tons, all high in phosphorus. Sweden's production of iron ore is about 6,000,000 to 7,000,000 tons per year, of which normally about two-thirds goes to Germany and one-third to England. Norway's prospective supply is about 218,000,000 tons.

The Cuban situation was thoroughly dealt with by C. M. Weld, who placed that country's iron-ore reserves at 3,000,000,000 tons. The deposits, being a soft, wet ore, the actual yield of these reserves will not be more than one-third or 1,000,000,000 tons. The speaker discussed the three important districts and the character of the deposits. Only one has been thus far actively worked, the Mayari. The Moa field is divided principally as follows: Bethlehem Steel Co., 78,500 acres containing 1,170,000,000 tons of ore; Midvale Steel Co., 19,840 acres with 300,000,000 tons; United States Steel Corporation, 15,000 acres with 210,000,000 tons; Eastern Steel Co., 50,000,000 tons; others, 155,000,000 tons, making a grand total of 1,985,000,000 tons. Mr. Weld stated that while the extensive nodulizing kilns are doing satisfactory work, experiments are being made with standard sintering processes which might prove better. The nodules analyze on the average 55 per cent of iron, 4.50 per cent silica, 13 per cent alumina, 1 per cent nickel and 1½ per cent chrome. The nodulizing capacity is 500,000 tons per year, and before the war the freight charge to the United States was 85c. per ton. He discussed the metallurgical features of the ore with its alloy content, and believed the future of this phase of the subject very important.

A. C. Spencer, of the U. S. Geological Survey, discussed the deposits of southern Europe and the Mediterranean, while Dr. C. F. Bain, of the U. S. Bureau of Mines, who recently returned from China, gave an interesting description of China's much-discussed and more or less overrated iron-ore resources. China's reserves he classed as of moderate value and similar in

character to those of Spain. The total he placed at about 400,000,000 tons.

It had been the expectation and plan of the program committee to have Prof. C. K. Leith, of the University of Wisconsin, Madison, Wis., now engaged at Washington, sum up the world situation, but he could not be present. J. E. Johnson, Jr., brought the session to a close by emphasizing a fact which he believed the general public did not realize—that if the Allies win the question of Alsace-Lorraine will be one not so much of justice to Germany or of justice to France but one of safety to the world. No nation can wage modern war unless possessed of iron ore. By taking the deposits of Alsace-Lorraine away from Germany her ability to again wage war will be crippled. Are we going to allow sentiment to rule in this matter or shall safety first be the slogan? There is but one answer—take that district away from Germany.

Line of Interchangeable Counterbores

The Cleveland Milling Machine Co., Cleveland, has brought out an interchangeable counterbore or spot facer. It is intended to reduce the amount of capital that must be invested if a large number of these tools are used.

The counterbore has been made in three sections, the shank, the cutter and the pilot. The first of these which is of heat-treated high carbon steel is made



The Cutter Which Is Driven by Two Face Keys Is Readily Removable from the Shank, So That Various Diameters of Cutters Can Be Used

in six different sizes and the taper is ground concentric with both the driving taper and the pilot hole in the end.

In all 41 different cutters of high-speed steel can be used. The interior of the cutter has a taper hole fitting the end of the shank and is threaded on one end to fit the two-face keys which are cut on the end of the shank. In this way, it is pointed out, cutters of various diameters from ¼ to 5 in. can be used, and it is also possible to grind the face of the counterbore too.

The pilot is a piece of heat-treated high carbon steel which is finished by grinding to fit the hole in the shank, and the diameter is ground 0.0015 in. smaller than the specified size. Any diameter of pilot can be used with any diameter of cutter within its range, and when it is necessary to change from one size of pilot to another or to change the cutter, it is possible to do this easily.

The Spanish Iron Ore Industry

The production of iron ore in Spain, especially in the province of Vizcaya, of which Bilbao is the commercial center, is declining, according to the *Revista Minera*. The decline is due to difficulties in working the mines, the scarcity of tonnage and the dangers of navigation. The ore waiting shipment at the ports much exceeds the available cargo space, and, owing to the dangers of navigation between Bilbao and England, owners prefer to send their ships to the East or to the United States. The following table shows the exports of iron ore in 1917 as compared with previous years in tons:

	From Bilbao	From Castro	Total
1914.....	2,257,414	127,173	2,384,587
1915.....	2,103,974	218,769	2,322,743
1916.....	2,435,233	301,856	2,737,039
1917.....	2,153,751	218,080	2,371,331

In 1917, 711 ships left with ore from Bilbao and 82 from Castro Urdiales. The smallest exports were in February of that year, when the submarine campaign began without previous warning. The output of the Vizcaya iron mines in recent years was 3,034,628 tons in 1914; 2,778,580 tons in 1915; 3,238,022 tons in 1916 and 2,750,904 tons in 1917.

Government Machinery for Recruiting Labor

How War Plants May Obtain Workers Without Competing Among Themselves—Plans for Nation-wide Settlement of Wage Scales

WASHINGTON, May 28.—The United States Employment Service has launched a campaign to induce employers in all lines, and especially manufacturers of munitions and others having war contracts which require the services of skilled mechanics, to recruit their labor through the Employment Service instead of acting independently and thus competing directly with each other.

Post Offices to Help in Labor Recruiting

Beginning with a small organization the Employment Service has now expanded until it embraces more than 340 regular branch offices and is now placing approximately 175,000 workers of all kinds per month. It has a large corps of traveling examiners—men skilled in determining the fitness of workers for particular jobs—attached to these offices. In addition to the regular branch offices it has made an arrangement with the Post Office Department whereby all third and fourth class postmasters and rural carriers, numbering approximately 100,000, are authorized to act as labor agents of the Employment Service. With these ramifications it is believed that the service can offer the employers of the country facilities for obtaining labor superior to those available from any other source.

Director General John B. Densmore, in charge of the United States Employment Service, is issuing an appeal to the employers of the country to use the service. He emphasizes that it was formed not only to equalize the situation of shortages and surpluses but to find new workers, a task that could not be performed by private employer or private agency. Continuing, he says:

"This was five months ago. This is what has been done since:

"The United States Employment Service has not only established new branch offices—free labor exchanges—but it has linked up all State and municipal free employment services, so that there is to-day a national employment office system covering the entire country. It has a centralization of authority with a decentralization of machinery and activities. This means that its work is conducted according to the needs of the particular State or community, and all local machinery is utilized, while labor clearances from one State to another or from one section to another are made possible and duplication of effort eliminated.

Thirteen Employment Districts

"This country has been divided into 13 employment districts, the districts being somewhat similar to the Federal Reserve districts. The dividing lines are marked by homogeneity of industrial activities and problems. In charge of each district is a district superintendent of the United States Employment Service, while each State is in turn in charge of a State director of the United States Employment Service. The latter usually is the State labor commissioner and is appointed only after recommendation by the State council of defense and employers and employees of his State. The State directors have charge of the federated offices and labor clearances within their States, while the district superintendents have general supervision over the States within their districts and clearances between those States. Clearances between the districts are in charge of a special clearance section in the main office of the Employment Service at Washington."

With the 340 regular branch offices and the co-operation of the Post Office Department the Employment Service expects speedily to be placing over 200,000 workers per month as compared with about 20,000 per month which were being placed last December. De-

scribing the labor-finding machinery of the Employment Service, Mr. Densmore says:

"The United States Employment Service has a recruiting division, known as the Public Service Reserve. It has a national director in Washington, William E. Hall, and a Federal State director in each State. The Federal State director of the Public Service Reserve in each State is subordinate to the State director of the United States Employment Service and in most cases both directorships are held by one individual. The Reserve in turn is organized in each county through a county director, while enrollment agents are established in virtually every township. Altogether the Public Service Reserve has some 20,000 enrolling agents, who bring the potential warworkers of every farming and industrial community into direct touch with the national office at Washington.

How the Employment Service Works

"This is how the Reserve works: Last January the Shipping Board asked the Department of Labor to find it 250,000 men skilled in trades used in shipbuilding who could be called as they are needed. The Reserve machinery was put in motion, with the result that more than 275,000 men were enrolled. This reserve is now being drawn upon. In the last 30 days about 28,000 were sent to the yards. And through the creation of this reserve the United States Employment Service began the cutting down of independent labor recruiting by the shipyards that was raising havoc with the shipbuilding and other essential industries."

At the present time every shipyard in the United States is using the Employment Service exclusively or in part to get workers of all kinds. On the Pacific Coast, especially, the service has been of value, filling up several yards after the obtaining of men was despaired of. If the rate of output by one Pacific yard, which has obtained its labor for months exclusively through the Employment Service were duplicated in all yards, Mr. Densmore says, we would this year build 13,500,000 tons of shipping.

"But the Public Service Reserve is doing more than getting shipbuilders," he says. "It has enrolled altogether more than 325,000 men, and daily is enrolling hundreds more. The men are classified according to fitness, and the lists are available to all branch offices of the Employment Service. When a branch office can not fill an order from the immediate applicants, it calls upon the Reserve for the State or district in which it is located. If the Reserve there cannot help, then the Reserve in more distant States and districts is utilized. The point is, the men are found. Men of unusual trades and high skill have been found by the Reserve for industries with contracts from the War and Navy Departments and for private employers with war work. Only through the Reserve could they be obtained. A thousand or more engineers and executives have been found for the War Department.

"The Reserve does not enroll promiscuously. It enrolls and classifies men in response to a call for a particular kind or division of labor. It does not place directly, that being done through the branch offices of the Employment Service.

"During the next 12 months the various war industries, including agriculture, will need between 3,000,000 and 4,000,000 workers. How are these to be found? The private employer and employment agency cannot get them; they take only workers already engaged in war production and aggravate the situation. They do not know where these additional workers can be found. Only the United States Employment Service, with its nation-wide recruiting machinery, can find them.

"The class of labor most in demand is common labor.

In the coming months from 150,000 to 200,000 men must be found for constructive work. Next to common labor the chief requirement is for mechanics—machinists and toolmakers. To get the mechanics the United States Employment Service must withdraw men from non-essential industries, and must withdraw them in such a manner that not a man is wasted and every enterprise drawn upon is subjected to a minimum of hardship. It would be wrong and unfair to manufacturers and to communities to arbitrarily decree that such and such an industry give up its men, so the United States Employment Service is going after the induction problem in a local way. In each industrial community it is enlisting the assistance of the chamber of commerce and other organizations of employers and business men. It is asking them to get together with the representatives of the Employment Service and the Reserve and decide what plants can best spare men and how many can be spared for war industries in the same locality which needs workers. Such a plan now is in effect in Rochester, N. Y."

Far-sighted manufacturers not only are using the Employment Service, Mr. Densmore says, but are reporting their labor needs and conditions as far in advance as possible. Thus 120 shipyards and several thousand munition plants are thus enabling the Service to find men for them in time. It has been found, however, that it has been necessary to educate employers to the use of the Service, as there are thousands of manufacturers who know of it only in a vague way. For this reason the Service is appealing to commercial organizations and to the great trade papers of the country to bring the matter to the attention of all employers.

Help in Locating New War Plants

An important recent development in the expansion of the Employment Service is the search its officers are making for locations for new war industries in sections where there are labor surpluses and ample housing accommodations. It is believed that congestion in eastern and other centers can thus be relieved to a substantial degree, and this phase of the matter has been taken up with the War Industries Board which is preparing to co-operate. The accurate and up-to-date information which the Employment Service is able to secure from its representatives throughout the country is being relied upon by the Government here especially with reference to locations for new projects and as to districts in which there is a surplus of labor. Because of these facts the Capital Issues Committee of the Federal Reserve Board has arranged to consult the Employment Service before passing on any application for securities issues involving new construction.

Standardization of Wage Scales

The Employment Service is also seeking the standardization of wage scales for various industries and localities. While there can be no flat rate, the officials of the Service believe that standardization is absolutely necessary to insure stability of workers, to fill up sections with shortages and to distribute surplus labor. Standardization, it is believed, will be a long step toward cutting down the tremendous current labor turnover.

Looking into the future the Employment Service is already planning to meet the big industrial shock that will come when the war is over and war industries must be converted into manufacturing establishments for peace materials. It will be the great task of the Government to see that this readjustment process is carried out with a minimum of demoralization, and it will be the special charge of the Employment Service and its Public Service Reserve to take care of this replacement. Manufacturers in all lines can be of great assistance in this particular task by co-operating to-day in strengthening the Employment Service by using its channels for the procurement of labor.

W. L. C.

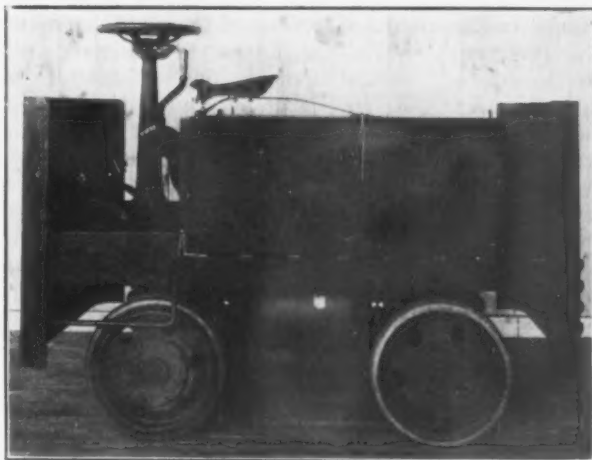
Arthur G. McKee & Co., Cleveland, have taken a contract from the Brier-Hill Steel Co. for two scale cars and for alterations to bins. The Buffalo Union Furnace Co., Buffalo, has placed an order with the same firm of engineers for a transfer car.

A Tractor with Interchangeable Parts

The Industrial Truck Co., Holyoke, Mass., is marketing a storage battery industrial tractor. It is made in the conventional end-control type and in another one where the operator sits in the center, and may by changing seats operate in either direction without being compelled to turn the tractor around. All parts except the wheels and the tires are interchangeable and can be used on the tractor, the storage battery locomotive or either type of the company's industrial truck.

The tractor steers on all four wheels and can be supplied with either a two or four-wheel drive. The frame is built up of steel channels with bumper plates of heavy boiler steel bent on the corners and riveted solidly to the frame. If desired the frame and the battery box can be removed by loosening four nuts, thus leaving the entire driving mechanism accessible for inspection and repair.

The battery boxes are constructed with readily removable side doors for changing the batteries and hinged top plates to give easy access for flushing or inspection. Power is transmitted from the motor to the wheels through a single reduction worm and worm gear,



An End-Control Type of Storage Battery Industrial Tractor in Which All Parts Are Interchangeable with the Corresponding Ones on the Locomotives and Industrial Trucks Built by the Same Manufacturer

a differential and a universal joint, which it is emphasized will operate at an angle of 43 deg. The joint is inclosed in a patented dust and oil proof case formed by the pivoting wheel knuckle and its supporting yoke.

The two brakes provided, an emergency and a service one, are controlled by pedals and have adjustable brake rods. In starting the tractor, it is necessary for the operator to occupy his seat and depress the emergency brake pedal. Whenever the operator's left foot is lifted from this pedal, the brake is applied, throwing the controller to the neutral position and the controller handle out of gear. After an emergency stop of this nature, the brakes must be released and the controller handle returned to the neutral position before it is possible to start the truck. An additional safety precaution is the arrangement employed for the steering wheel. When the operator desires to leave his seat, he must tilt the wheel before he can do so, and this tilting arrangement, it is explained, is interlocked with the controller shaft clutch, so that the controller circuit cannot be closed to admit current from the battery to the motor until the wheel is in the running position.

In addition to the tractor the company builds a storage battery locomotive for gages ranging from 24 to 56½ in. The construction is practically the same as that of the tractor, except that the differential and the universal joint driving and steering mechanisms are omitted and flanged steel wheels are substituted for the rubber-tired ones. Two types of industrial truck can also be furnished. One of these has a stationary platform, and the other is of the elevating platform type, the capacity of both being the same, 4000 lb. The load of the latter truck is lifted to a height of 5 in. by a hydraulic ram which in turn is connected through its pump to a small motor.

Impressions of New England Industries in War Time

(Special Correspondence.)

WAR activities in New England States are many and intense in these days. One may be entirely justified in thinking that he is not lacking in enthusiasm for the winning of the war; but a visit of a few days to manufacturing plants, particularly those in Connecticut, will make a more thoroughgoing patriot of anybody. After all the discussion that has taken place in regard to the Browning gun and other war equipment, people in general who are without accurate information are inclined to wonder whether much is really being done even now in the way of manufacturing ordnance and ammunition. Some of the plants engaged in Government work, and subject to a large extent to Government control, open the doors to visitors in a rather cautious way, if at all, and it is not easy to obtain exact figures; but beyond all question a tremendous amount of work is being done and much more will be accomplished at an early date. For example: At the splendid new gun plant directed by the Government at Bridgeport and operated by the Bullard Machine Tool Co., there has been delay in getting forgings, but beginning about two weeks ago they have been coming in from Bethlehem and the finishing of guns for the navy has started in earnest.

Plant Built by Germans

The plant of the Liberty Ordnance Co. at Bridgeport is intensely interesting, not only on account of the work that it is doing for Uncle Sam, but also on account of the fact that it was built about three years ago by German capitalists who evidently had no idea that the United States would get into the war. Several plans of operating the plant have been tried, but at last everything seems to be running smoothly through the co-operation of the Government and the operating company, the American Can Co. Great obstacles have been overcome, and, barring labor troubles, satisfactory progress is assured. The general manager, A. E. Moore, is a man of large experience and marked ability and present satisfactory conditions are due largely to his untiring efforts.

The great Remington plant at Bridgeport has been closed to visitors of late, but there is some reason to hope for the adoption of a more liberal policy, and those in position to know believe that when the Government takes the people into its confidence and lets them know what is being done at that plant the report will be highly pleasing.

At the very large and modern plant of the Winchester Repeating Arms Co., New Haven, the output of rifles is very large and the light Browning machine gun is being turned out in goodly numbers. Within the past few days final tests demanded by the Government to insure absolute interchangeability of parts have been made with complete success, and it is expected that the production will be rapidly increased.

The Labor Situation

In spite of the extremely high wages now being paid at plants manufacturing munitions for the Government, the labor situation has been tense in

many plants. As reported in *THE IRON AGE* recently, more than 700 tool makers went on a strike at Bridgeport and the outlook for a few days was serious, but patriotic appeal to the men was promptly made and with the desired results. It was well known that Government officials were investigating the entire wage question with the purpose of fixing a proper wage scale, but the workmen were impatient and threw down their tools. In spite of such occasional manifestations, there is also evidence of genuine patriotism of the vast majority of the workers. In the Bullard plants, for instance, every one of the 1200 or more employees subscribed for at least one Liberty bond. In the Winchester plant, one day during the recent Liberty loan campaign, all but one of the hammers in the big forge shop suddenly stopped and the men quickly assembled around one hammer which was still being operated by a man who refused to buy a Liberty bond. This individual soon bought a bond and the patriotic strike was ended.

Confidence in Ex-President Taft

While it is recognized that the new National War Labor Board has an immense job on its hands, great confidence is felt in William Howard Taft, and hope is entertained that under his wise leadership, industrial peace may be maintained throughout the period of the war, and that the machinery for adjusting disputes in war time will form a model of a plan for permanently settling disputes between capital and labor.

Testing the Golden Rule

The Golden Rule method of dealing with workmen is being put to the test in these trying times of strife. So far, plants where bonus systems are in use have been getting along with little friction, and report that the labor turnover is remarkably small. The Bullard Machine Tool Co. officials are enthusiastic about their bonus plan. Their superintendent of labor, Frank Smith, is a genius in his way. Strange as it may seem, Mr. Smith, during many years of his life, wandered about the country, going from one kind of work to another, but perhaps for this reason he has been eminently successful in reducing labor turnover. He knows thoroughly the causes of dissatisfaction. When the writer asked him why he had been so successful, he replied: "There is no mystery about it; it's just a case of thinking a little more of the other fellow and putting the Golden Rule into effect." Some folks doubt whether the Golden Rule will work throughout the war. Time will tell. Perhaps no one in the Central West did more to popularize the application of the Golden Rule in manufacturing plants than the late Samuel W. Jones, many times mayor of Toledo, and known for years as "Golden Rule Jones." One can go to the New York Public Library and work for half a day, as was actually done by one man recently, without finding as much as a scrap of paper about Jones, but Frank Smith of Bridgeport, Conn., knows about him, and is living up to his principles. And there are others.

Manufacturers have not forgotten the many mistakes that have been made at Washington; but they all realize how difficult it is to increase production suddenly during a period of inefficient help, and they are disposed to make large allowance. On the whole, the disposition is to put emphasis on achievements rather than on failures. A New Haven manufacturer, a Princeton graduate, who received his diploma from Woodrow Wilson, refuses to endorse much that the President has done, but he adds: "Wilson is the greatest Secretary of State we have ever had." This is one way of saying that the President's state papers are much better than much that has been done under his cabinet officers in departments vitally connected with manufacturing interests of the country.

One of the results of the war has been the reduction in income of all the colleges in New England which depend upon tuition fees for support, and business men and others are coming to the front with great enthusiasm and patriotism to wipe out the deficit. Robert H. Cory, president O'Sullivan Rubber Co., New York, in a recent speech at New Haven, said that the success of the alumni in raising more than enough money to wipe out Yale's deficit of \$260,000 this year was due to organization, publicity and spiritual leadership. The leader was not a lawyer or a preacher. He was only a business man—Henry S. Brooks, of the New York Telephone Co. Yale and other colleges are giving special courses to equip men for service in the army and navy and topics relating to business and engineering are receiving more attention than ever before. Soon after the United States entered the war it was found that the students were restless and that the only way to hold them in school was to give them considerable military work; but as the science of fighting nowadays consists very largely of knowing how to operate machines and conduct things in a business-like manner, the young men who are taking military courses, if they are never called to the colors, will have an education just as valuable for most of them as they would have obtained in a time of peace. G. S.

Agree on Catalog Sizes

At the close of an all-day session in the Hotel La Salle, Chicago, May 22, a conference called by the catalog committee of the National Association of Purchasing Agents voted approval of catalogs in the following sizes: 6 x 9 in., 7½ x 10½ in. and 8 x 11 in. It was recommended that all users of catalogs adhere to these sizes so far as possible. The sentiment of members of the National Association of Purchasing Agents was in favor of the 7½ x 10½ in. size, which conforms with what is known to printers and binders as the hypotenuse oblong, which may be repeatedly halved and the resultant parts will bear the same relation to each other as before.

The conference was attended by purchasing agents, representatives of paper mills and catalog houses and various technical societies interested in catalogs. All agreed that wastage in paper should be eliminated as a wartime economy measure. It also was recommended that catalog paper colors be limited to white and natural.

Arthur G. McKee & Co., Cleveland, have taken a contract for relining and fitting up for operation blast furnace of the former Canada Iron Corporation, Midland, Ont., which has been out of blast four years. A new company is being formed in which James Playfair and other Canadians are interested to operate the plant. The mill plant formerly consisted of two furnaces, but one of these was recently sold to the Algoma Steel Co., and moved to Sault Ste. Marie.

Invoicing Sketch Plates

The following statement has been issued by E. H. Gary, chairman Committee on Steel and Steel Products, American Iron and Steel Institute:

In announcing revised maximum prices, differentials and extras under date of May 21, 1918, it was stated that the revised method of invoicing sketch plates should be added to the extras for irregular sketches shown on page 34 of the institute pamphlet. It has been pointed out that this might be construed to mean that the revised basis for invoicing sketch plates would apply to irregular sketches only. It is the intention of the committee that the revised basis for invoicing sketch plates shall apply to all sketches. In order to remove any doubt as to such intention, the announcement of May 21, 1918, in regard to steel plates is hereby cancelled and the following substituted therefor:

STEEL PLATES.

Between the extras for irregular sketches shown on page 34 of the institute pamphlet and the extras for circles shown on the same page, insert the following to govern extras for both regular and irregular sketches:

Sketch plates (other than those sheared to a radius) will be invoiced at actual weight of the sketch, at the base price, plus standard card extras (including sketch extras), with an additional charge for waste, if any, to be determined by deducting the actual weight of each sketch from the estimated table weight of the smallest rectangular plate from which said sketch can be secured, the difference to be invoiced at the rectangular plate price, less an allowance for the value of scrap, at the price fixed by the Government for No. 1 heavy melting scrap.

Cancel the first item under the subheading "Special" on page 34, reading as follows:

Wasteful or difficult sketches, including hexagons, octagons, etc., are subject to special extras.

Milwaukee's Subscription to the Red Cross

MILWAUKEE, WIS., May 27.—More than \$1,000,000 has been subscribed in Milwaukee toward the Second Red Cross War Relief Fund, compared with an allotment of \$750,000. The metal trades group, as usual, led all divisions in total subscriptions. Among the largest subscribers are:

International Harvester Co., \$20,000; Allis-Chalmers Mfg. Co., \$12,000; The Falk Co., \$10,000; A. O. Smith Co., \$10,000; Kearney & Trecker Co., \$10,000; Pawling & Harnischfeger Co. and employees, \$6000; Harley-Davidson Motor Co. and officers of the corporation, \$8500; Cutler-Hammer Mfg. Co., \$5000; Kemp Smith Mfg. Co., \$5000; Federal Pressed Steel Co., \$5000; Milwaukee Coke & Gas Co., \$5000.

The subscriptions of other metal working concerns ranged from \$1000 to \$4500. The largest individual subscriptions were made by Ferdinand Schlesinger and his sons, Henry J. and Armin A., who together contributed \$30,000. The various Schlesinger industries made separate subscriptions of large amounts each.

Mill Workers' Wages Reduced

At the bi-monthly wage settlement between the Amalgamated Association and the sheet and tin plate mills that sign the Amalgamated scale made at Joliet, Ill., this being the place where the regular annual convention of the Amalgamated Association has been in session, it was found that the average price on shipments of 26, 27, and 28-gage sheets in March and April was 5.10c. per 100 lb., as against 5.35c. in the two previous months, this decline causing a reduction in wages of sheet mill hands in May and June of 7½ per cent. It was found that the average price on shipments of tin plate in March and April was \$8 per base box, against \$8.40 in the two preceding months. This means that wages of tin mill hands in May and June will be reduced 8 per cent, as compared with wages paid in March and April.

The National Pump & Machine Co., Oil City, Pa., has increased its capital stock from \$2,545,000 to \$3,181,250. It is stated the company will make large additions to its plant.

Overcharging by Some Hardware Jobbers

Government Prices Disregarded, According to Reports to Metal Branch of National Hardware Association, Which Is Not Approved by Convention

At the seventh annual meeting of the Metal Branch of the National Hardware Association held in the William Penn Hotel, Pittsburgh, on Friday and Saturday, May 24 and 25, there was then some informal discussion as to whether jobbers were maintaining recommended warehouse prices. This developed that in certain sections some jobbers were not respecting Government prices, but were charging premiums. They tried to explain this action by saying that in many cases they were unable to get deliveries of material from the mills, and in an effort to fill their orders would buy goods from other jobbers who charged them regular jobbing prices. They felt that under these conditions they were justified in adding to the selling price a fair margin of profit. The price of No. 28 gage black sheets delivered in the Philadelphia district is 5.45c., and the price charged by jobbers has been about 6.70c. However, it was found that sales of black sheets by jobbers to the retail trade had been made in some cases at higher prices. It was the sense of the convention that this practice should be stopped, as it was considered unpatriotic and unfair to the Government. There was also some discussion as to the effect which the scarcity and high cost of terne plate is having on the roofing business. Several members stated that their roofing business was very dull, and they were not trying very hard to push it, owing to the inability to get terne sheets. The Government is insisting on a maximum output of tin plate, and the mills are rolling as little terne plate as they possibly can.

President's Address

W. H. Donlevy, Carter-Donlevy & Co., Philadelphia, who has served the Metal Branch as president for four years, in his annual address said:

"I feel it can be said without fear of contradiction that the iron and steel interests have been second to no other industry in loyalty and in co-operation with the Government, in its gigantic task of winning the war. The abnormal conditions ruling have created for us entirely new problems. I am confident the intelligent consideration and discussion of these questions at this convention will prove profitable to all of us, and that we will go back to our homes much better equipped to adjust our affairs to the needs of our Government, and make us, if possible, more loyal and patriotic citizens of our beloved country."

An address was made by Robert Garland, ex-president of the Chamber of Commerce, Pittsburgh, on "Foreign Trade After the War." Mr. Garland spoke at some length upon the means this country will have to take to establish itself firmly as a leading factor in foreign trade when the war is over, pointing out that our first great need would be ships to transport our goods. These, it seems now, will be supplied, also money to finance foreign countries that have been devastated by the war, and further to be able to make the kinds of goods that will be needed in the foreign countries.

John A. Penton, Cleveland, spoke on "Present Tendencies in American Iron and Steel Industry." Mr. Penton urged the hardware men to do their utmost to eliminate non-essentials altogether and, in order to concentrate on a plan of conservation of steel, to organize a committee for the purpose of co-operating with a subcommittee of the American Iron and Steel Institute recently selected by the War Industries Board to study this problem thoroughly.

L. C. Bihler, for many years traffic manager of the Carnegie Steel Co., Pittsburgh, addressed the convention on present traffic conditions among the railroads. Mr. Bihler said he believed that the railroads are

gradually working out of their former condition of chaos, and that with the large orders being placed by the Government for locomotives, cars, and other equipment, the railroads would soon be fully able to handle the great traffic existing.

The report of the Metal Committee said in part:

Recognition of Wholesale Distributors

Among developments in the situation during the last year, it is believed that the wholesale distributor may take considerable pride in the recognition both by the Government and the steel manufacturers of the value of the distributing services of the wholesaler. It has been recognized and admitted on several occasions that the war progress has been substantially speeded up through the quick supply of needed materials from the wholesalers' stocks, and if it would have been necessary to have waited for the manufacturer to produce and deliver the material two or three months' delay could readily have ensued. Of course, it is recognized that this applies to the local needs which it was necessary to supply and does not refer to such great quantities of material as are involved in the shipbuilding and other extensive programs. Some comments have been heard from Washington regarding what they call the middleman, and we would explain from the best evidence we can secure reference is not made to the whole distributor who has a properly capitalized business and who has a warehouse containing a substantial stock of the materials in which he deals but that the "middleman" Washington authorities refer to a large number of brokers or manufacturers' agents who have sprung up since the war and who have harassed, annoyed, and disappointed responsible officials of the Government who had reason to believe that they were dealing with well-established concerns."

Conditions in Sheet Industry

C. L. Pollock, auditor of the Apollo Steel Co., Apollo, Pa., manufacturer of galvanized sheets, spoke briefly on conditions existing in that industry. Mr. Pollock said that owing to the enormous demands of the Government for open-hearth steel the manufacturer of galvanized sheets had been largely restricted, and that some mills, owing to shortage in sheet bars had not been able to operate for some months more than 35 to 50 per cent of capacity. The demand for galvanized sheets for some purposes such as eaves trough, conductor pipe and other similar products had fallen off very much owing to the dullness in the building trade all over the country.

There was an informal discussion as to whether the Government war tax should be included by the jobbers in the selling expense account, or whether it should be carried simply as an extra expense. The opinion of the convention was about equally divided on this question.

E. T. Sproull, general manager of sales of the Trumbull Steel Co., Warren, Ohio, made an address on "The Present Situation in Manufacturing and Sale of Sheets and Tin Plate." Mr. Sproull said in part:

"The sheet mill and tin mill branches of the steel industry have established themselves firmly with the Government, by showing a disposition from the very beginning to co-operate and furnish any part or all of their production for war purposes. To do this naturally meant disappointment to many of their most loyal customers. Much tonnage on order was continually pushed back on the rolling schedules to make way for the more urgent war orders. Government orders were all located in large tonnages to the various sheet mills through the Sub-Committee of the American Iron and Steel Institute, located in Pittsburgh. More Government orders came direct from the Navy and other Governmental purchasing agencies, all of which rapidly filled up the available capacity of the sheet mills and left little, if any, room for commercial business, al-

though much of this tonnage asked for by the commercial trade was needed and could be traced step by step to a point where it actually was going to serve a part in the war program. Due, however, to its deferred classification, it had to be considered in the list of so-called non-essentials. Some months ago, seeing the present situation developing rapidly, the organization I have the pleasure to represent wrote to all their jobbing customers and asked for information as to what part of the tonnage on order could be considered in a priority class. Many replies of an interesting nature were received, and, without exception, each and every one made it clear that the jobber was doing a noble service. On the Pacific and Atlantic coasts, as well as the Great Lakes district, stocks were being utilized and depleted by consumers doing direct and urgent war work, principally building of ships, warehouses and shelter houses for soldiers and supplies. In the Central West, South and Southwest, stocks were being distributed to the farming and agricultural trade, which means more food for the armies and the millions of workers at home.

"Food Administrator Hoover has worked untiringly to stimulate the production of foodstuffs, and it is estimated that fully 22,000,000 base boxes of tin plate will be required to properly preserve the crop production of this country, and fully 5,000,000 base boxes additional for our Allies, a total of 27,000,000 base boxes against a possible production of 35,000,000 base boxes on a 100 per cent operating basis. It leaves very little tin plate for uses other than food. The mills are exerting every effort to fill their part of the program and much steel is going into the manufacture of tin plate at the sacrifice of less essential products."

Trade Acceptances

There was some discussion as to the experience of the jobbers with trade acceptances, and while only a few of the jobbers had adopted the acceptances as a part of their business policy, they stated that in the main they found them satisfactory, and recommended that the use should become more general. This was followed by an informal discussion of how the jobbers can best co-operate with the Government in taking care of Government requirements. It was the consensus of opinion of all the jobbers that they should give every aid possible to the Government, the question of personal expense or sacrifice to be eliminated, and that the jobbers as well as everyone else should do this with the object of winning the war at the least possible sacrifice of life, and also in the shortest time possible. Some very patriotic short speeches were made by the members on this question.

Clifford E. Pierce, of the Betz-Pierce Co., Cleveland, was scheduled to read a paper on "The Effect of War on the Cost of Distribution." His paper was read by Acting Secretary Fernley. Mr. Pierce stated that the war had had the effect of greatly increasing the costs of distribution of goods in every direction, and that it was impossible to find enough competent labor to meet the needs. He said his concern was employing many more clerks than before the war started and at much higher wages, and yet the amount of work turned out was less. He said he believed the situation would grow worse as the war continued, and that it would be necessary to employ women in some branches of the business, where heretofore only men had been used.

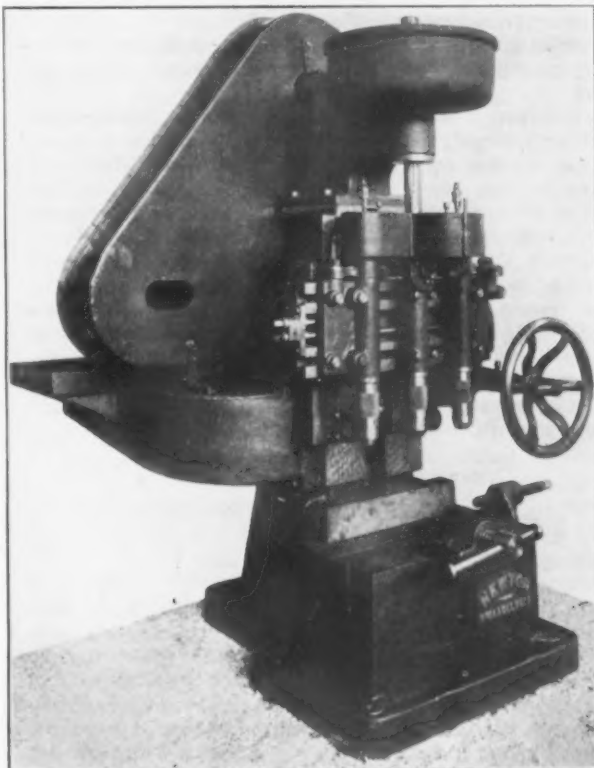
O. T. Ross, of the Delphos Mfg. Co., Delphos, Ohio, spoke briefly on conditions in the eaves trough and conductor pipe trades. Mr. Ross said that new business in these products was very slow, owing largely to the great falling off in new building all over the country.

The Youngstown Sheet & Tube Co., recently bought 180 acres near the acreage it already owns, on which it is conducting its housing project for employees. The company has decided to build 100 houses at East Youngstown, which will make 250 built there last year and this year. The Unit Construction Co., St. Louis, is building most of these houses.

Multiple-Spindle Rail Drilling Machine

A machine for drilling from one to three holes in the end of a rail simultaneously has been brought out by the Newton Machine Tool Works, Inc., Philadelphia. The machine uses three spindles $1\frac{1}{4}$ in. in diameter, the central one being fixed in position, while the other two can be adjusted on the cross-rail by hand screws to give center distances ranging from $3\frac{1}{2}$ to 9 in. with relation to the central spindle. All of the spindles operate separately at a rate of 125 r. p. m., and can be readily removed from the cross-rail if desired. Two rates of speed 0.007 and 0.04 in. per revolution of the spindle are obtainable, the three spindles being mounted on a single saddle which is counterweighted and provided with vertical feed and hand adjustment and feeding in the unison. The maximum distance between the lower end of the spindles and the top of table is $19\frac{1}{2}$ in.

The work table, which measures 16x30 in., has an adjustable back plate, a clamping screw and a reversing stop, a slot being cut in the upper surface of the



Three Holes Can Be Drilled Simultaneously in a Rail by a New Machine Having One Fixed and Two Adjustable Spindles, a Slot in the Work Table and an Adjustable End Stop, Insuring Accurate Duplication of Spacing

table to facilitate the locating of the rails in the proper position. The base of the machine is surrounded by an oil pan and contains the lubricant tank. A lubricant pump and the necessary piping provide for the delivery of cutting compound at the point of the drills, the liquid flowing back by gravity to the tank.

The machine is driven by a motor mounted on a bracket at the left side of the machine. A belt transmits power from the motor to the main driving pulley which is 26 in. in diameter with a 5-in. face. This is located on the back of the upright and is entirely inclosed to protect the operator from injury. From the main driving pulley the power is transmitted through bevel and spur gears to the spindles. Nickel steel is employed for the driving gears all of which are inclosed.

The main building at the plant of the Worth Steel Co., Claymont, Del., is nearing completion. Other auxiliary structures at the new steel works are also rapidly being finished. The entire plant will represent an investment of about \$1,000,000.

Tin Shortage Compels Regulation of Uses

Exports of Tin Plate for Containers Limited to Those for Food—Conserving Tin in Electrical and Other Manufactures

WASHINGTON, May 28.—The prospect of an acute tin shortage is such as to cause the War Industries Board anxiety lest the supply for the coming six months may be so reduced as to make it difficult to provide enough for absolutely essential purposes. To meet the situation the board is imposing drastic limitations upon the exportation of tin plate and the conservation division (formerly known as the commercial economy board) is speeding up its investigation of the uses of tin with a view to curtailing all non-essential consumption. While from 15,000 to 20,000 tons of tin will be required for the war program over and above the normal consumption, it is hoped that by reducing commercial uses of tin by an average of 30 per cent the supply will meet all essential requirements during the war.

For many months the United States Government, although largely dependent upon England for a supply of pig tin, has permitted the metal to be used for many purposes for which it has been prohibited throughout Great Britain and her colonies for more than a year. Very considerable quantities of tin plate have been exported to Canada and there used in the manufacture of articles for which British plate could not be employed, and liberal shipments have also been made to Mexico and South and Central American countries. So far as domestic use of tin is concerned no limitation has been attempted beyond the voluntary agreements secured with a few large users, notably the leading can manufacturers, which were obtained last summer.

Uncertainty of Dutch Supply

Facing the certainty that the demand for tin for war purposes, added to the normal consumption of the country, will carry our requirements far above the prospective supply, which is now figured at but little more than 70,000 tons and which may fall below that figure, the Government has made every effort to supplement the ration of tin furnished by Great Britain and especially to increase the quantity obtained last year from the Dutch East Indies. The shipping controversy with the Dutch Government has proved decidedly embarrassing in this connection and the amount of tin obtainable from this source is in doubt.

Within the past few days a distinct crisis has developed growing out of the refusal of the United States to release three ships to carry grain to Holland and the insistence of this Government that Dutch ships shall be sent from Rotterdam for this purpose. Shortly before this incident the Dutch Government had cabled the Governor General at Batavia to restore the regular sailing schedule of the Dutch lines running to Pacific ports of the United States and the first ship was to have sailed on May 25. Immediately after the development of the new controversy regarding the transportation of grain the sailings of all Dutch ships were cancelled and although it is stated at the Dutch Legation here that the new move is a postponement and not a prohibition, the outcome is shrouded in great uncertainty.

Export Tin Plate Limited to Food Containers

Under these conditions the War Trade Board, acting in conjunction with the War Industries Board, has decided that "for the present at least" no more tin plate may be exported to foreign countries for the manufacture therein of containers for anything but food products. This order has encountered many protests and will undoubtedly work serious hardship, as considerable American capital has been invested in factories in Canada, Mexico and other countries for the manufacture of cans intended for a variety of non-food

purposes. One large new factory in Mexico has already been obliged to shut down.

The War Industries Board has not yet reached the point of limiting the use of tin in the manufacture of containers for domestic products, though some tin plate manufacturers have recently confined their new bookings to makers of food containers. The conservation division, however, is in touch with all the principal users of tin cans and is making every effort to reduce consumption to a minimum.

Reduced Use in Electrical Work

Through the general war service committee of the electrical manufacturing industry an arrangement has been made to secure the co-operation of manufacturers in cutting down the amount of tin used along lines that have been suggested by the investigations of the conservation division and experiments made by leading houses in the trade. The methods to be followed by this industry are of much interest, as they will be pursued with respect to other industries as rapidly as the conservation division can take them up. They are indicated in a bulletin which has just been issued to electrical manufacturers and which is in part as follows:

The United States Government has assumed control of the importation and distribution of tin in the United States. Demand is made that the use of tin cease for all non-essential purposes and be reduced elsewhere to the minimum consistent with the production of material and apparatus which will function safely and satisfactorily.

If electrical manufacturers are to obtain their supply of tin, it will be necessary for every one to economize to the fullest extent possible.

The uses of tin are for three general purposes, viz.: 1. Babbitt metal; 2. Alloy castings; 3. Tinning and soldering. In these tin consumption can be reduced by—

1. (a) The use of lead-base babbitt metal in substitution for tin-base babbitt metal.

(b) The reduction of tin content in tin-base babbitt where the use of the latter is necessary.

(c) The use of the thinnest section of babbitt metal consistent with a satisfactory bearing. Babbitt is frequently wasted in thick linings. Layers of babbitt metal not exceeding 1/16 in. thickness will make a very satisfactory lining if sweated to a proper backing metal.

2. The percentage of tin in most alloy castings is unnecessarily high. It is common practice in brass foundries to look on tin as the cure for most troubles in producing brass or bronze castings. Even a one per cent reduction throughout the country would result in an enormous saving in the total consumption.

3. (a) Pure tin solder is frequently used where mixtures of lead and tin in varying proportions may safely be substituted.

(b) Half tin to half lead solder is very commonly used, whereas a mixture of 55-60 per cent lead is often equally satisfactory. In many cases lead may be safely increased to 70 per cent with 30 per cent tin.

(c) It is common practice to dip ends of leads and other parts to be soldered into molten tin in preference to common solder mixtures because mixtures when kept melted for a long time tend to separate into layers of different composition. The eutectic alloy, 63 per cent tin to 37 per cent lead which melts at 180° C., will not separate as long as this proportion is fairly well maintained. Use such a bath when soldering with lead-tin alloys and use tin only when parts must be soldered with pure tin.

The foregoing suggestions only cover a few means of reducing the consumption of tin to the necessary minimum. Other suggestions which you can furnish your General War Service Committee will be welcomed.

The war needs of our industry in this respect are fundamental; consequently, your immediate, active co-operation is of vital importance.

The economies which may be obtained by observing the foregoing suggestions are calculated to represent a saving of 25 per cent, which is the average figure aimed

at in all the conservation plans. As heretofore stated in THE IRON AGE, a saving of at least 25 per cent has been secured in the use of tin plate for the manufacture of paint containers by eliminating small packages, employing wood for large packages and making a 50 per cent reduction in the number of colors and shades made, which will mean an equivalent cut in the lines to be carried by jobbers and retailers.

Within a few days the conservation division will issue a series of suggestions to manufacturers of bronze castings, including pipe fittings, valves, etc., and to manufacturers of babbitt metal and solder. In all these lines investigation has shown that very little attempt has been made in the past to reach minimum standards of tin consumption and it is believed that economies representing at least 25 per cent on the average can be obtained by reducing the tin content and by saving wherever possible in the use of the product into which the tin enters. It is believed that the consumption of babbitt metal for bearings, for example, can be substantially curtailed along the lines suggested in the bulletin to the electrical manufacturers by employing thinner sections of babbitt sweated to a proper backing metal.

Lines of Tin Consumption in 1917

The latest figures showing the consumption of pig tin in this country during the calendar year 1917, which were gathered by the War Industries Board, indicate that tin and terne plate absorbed 26,700 tons; solder, 17,000 tons; babbitt and other bearing metals, 10,800 tons; brass and bronze, 4800 tons; foils, 4000 tons; collapsible tubes, 2100 tons; white metal, 1764 tons, and miscellaneous, 9093 tons, making a total of 76,257 long tons. The miscellaneous uses include galvanizing, 105 tons; tinning and retinning, 2512 tons; bells, 15 tons; pipes, 896 tons; rubber, 126 tons; pipe metal, 35 tons; bullets, 65 tons; plated ware, 1002 tons; chemicals (oxide, bichloride crystals, tetrachloride and crystals of), 1918 tons; not specified, 900 tons.

For the first quarter of the current calendar year imports of tin have averaged 5873 gross tons per month, or at the rate of 70,476 gross tons per annum. Adding 15,000 tons for war purposes to the domestic consumption of 1917 it will be seen that the requirements for the current year will exceed 90,000 tons, as compared with a supply now in sight of approximately 70,000 tons.

W. L. C.

Copper Production in 1917

The advance statistics of the 1917 output of copper, issued by the U. S. Geological Survey and compiled by B. S. Butler, show that the smelter production was 1,886,120,721 lb., as compared with 1,927,850,548 lb. in 1916, a decrease of 41,729,827 lb. The output of refined copper was 2,507,663,067 lb., as against 2,363,811,122 lb. in 1916. The 1917 increase is explained as due to a larger output from foreign electrolytic. Stocks of copper on Jan. 1, 1918, are put at 114,000,000 lb. or 14,000,000 lb. less than on Jan. 1, 1917. The apparent domestic consumption in 1917 was 1,316,463,754 lb. as compared with 1,429,755,266 lb. in 1916 and 812,268,639 lb. in 1913. New high records were made in both exports and imports in 1917. Exports were 1,126,000,000 lb. against 784,000,000 lb. in 1916 and 200,000,000 lb. larger than the 1913 exports, the best previous record when they were 926,000,000 lb. Imports in 1917 were 556,000,000 lb. against 462,000,000 lb. in 1916.

Because there are no available houses in Hammond, Ind., the Standard Steel Car Co. is housing 5000 employees in flats and dwellings in the south and east sides of Chicago. As they are working on war munitions, the Government co-operates in getting the men free transportation to and from work. The Standard company also operates 40 motor buses in conveying workmen who live in nearby towns.

The Suwanee Iron Co., Grand Rivers, Ky., expects to have its No. 2 furnace ready for blowing in by June 15. No. 1 furnace is already in operation.

Mechanical Engineers' Meeting Next Week

A general war session will be held by the American Society of Mechanical Engineers at its spring meeting next week at Worcester, Mass. The war session will be held on the evening of June 5 at the Bancroft Hotel. The general theme will be: "How the Engineering Society Can Assist in the Procurement Plan of the Government; Ordnance and Ships for the Navy Department; Munitions for the Army; Aircraft Material."

At 2 p. m. on June 5 simultaneous sessions will be held at the Worcester Polytechnic Institute. In one of these papers are to be presented on "Converting a Foundry for Munitions Manufacture; Training Labor for Shipbuilding; Oil Fuel in New England Power Plants." In another session will be presented a number of papers, including "Foundry Costs and Accounting Systems," by W. W. Bird, professor of mechanical engineering, Worcester Polytechnic Institute; "The Public Interest as the Bed Rock of Professional Practice," by Morris L. Cooke, Council of National Defense; "A High-Speed Air and Gas Washer," by Lieut. J. L. Alden, Ordnance Department.

The third of these sessions is devoted to safety matters, including a paper by L. A. De Blois, safety engineer E. I. du Pont de Nemours & Co., and one on a course of instruction on safety work by George L. Foland, professor of commercial engineering, Carnegie Institute of Technology.

On Thursday, June 6, are scheduled three simultaneous sessions, one on fuel, one on vocational training and one on general matters. In this last will be presented papers entitled "Efficiency of Gear Drives," by Prof. C. M. Allen, Worcester Polytechnic Institute, and F. W. Roys; "Self-Adjusting Spring Thrust Bearing," by H. G. Raist, General Electric Co., Schenectady; "Air Propulsion," by Morgan Brooks, University of Illinois; "Elastic Indentation of Steel Balls Under Pressure," by C. A. Briggs, Bureau of Standards, and W. C. Chapin and H. G. Heil; "Electric Heating of Molds," by Harold E. White, Crocker-Wheeler Co., Ampere, N. J.; "Stresses in Machines When Starting or Stopping," by F. Hymans, Otis Elevator Co., New York.

At the opening exercises on the evening of June 4 addresses will be made by Past-President Ira N. Hollis, Worcester Polytechnic Institute, and R. Sanford Riley, president Worcester Chamber of Commerce and president Sanford Riley Stoker Co., Worcester.

Large Exports of Locomotives

Exports of locomotives are on a larger scale than ever before, according to official Government statistics. In 1917 they were at the rate of 148 per month and in the nine months ended March 31, 1918, they were at the rate of 128 per month. The following table gives the totals by years:

1913.....	491	1916.....	825
1914.....	269	1917.....	1,778
1915.....	621		

The destination of the locomotives shipped in 1917 and in the nine months ended March 31, 1918, was as follows:

	1917	Nine Months Ended March 31, 1918
France	570	192
Russia in Europe.....	206	157
Canada	148	102
Mexico	83	52
Cuba	88	90
Brazil	26	3
China	15	21
Russia in Asia	145	145
Other countries	497	395
Total	1,778	1,157

There were no exports to Europe in 1913. Of the total of 491, the largest amount, 154, went to Brazil; 127 were credited to Canada, 67 to Cuba and 33 to Japan. Exports to Russia have ceased.

The Trumbull Steel Co., Warren, Ohio, has decided to increase its common stock from \$6,000,000 to \$14,000,000, making the entire capital of the company \$20,000,000, of which \$14,000,000 is common, and \$6,000,000 preferred stock. As yet, plans for issuing the new common stock have not been made.

TWENTY BILLION DOLLARS

Estimated Expenditures of War Department for Year Beginning July 1

WASHINGTON, May 28.—The annual army appropriation bill carrying in specific appropriations and authorizations for expenditures the stupendous sum of \$12,041,682,609 has been reported to the House by the Committee on Military Affairs and will be called up for consideration within a few days. All previous records for the appropriation of money, even during the war period, are dwarfed into insignificance by this colossal budget measure, which is intended to provide for the military establishment during the fiscal year beginning July 1, next, but which will be succeeded by a fortifications bill carrying \$3,300,000,000 and will be supplemented at the present session by an Army deficiency bill based upon recommendations submitted by the Secretary of War during the past week for an appropriation of \$1,500,000,000 for ordnance and supplies and an authorization for the War Department to expend \$7,118,562,466 additional for "such ordnance as in its discretion may be required during the fiscal year ending June 30, 1919." It would thus appear that the War Department is contemplating expenditures during the year beginning July 1, next, in excess of \$20,500,000,000. These figures are based upon the cost of maintaining an army which, during the coming fiscal year, is expected to reach 3,000,000 men.

Upward Revision

The most impressive feature of these tremendous figures is the graphic manner in which they reflect the constant upward revision of the official estimates of the cost of carrying on the war. The total appropriations for the military establishment for the fiscal year ending June 30, next, have been \$5,248,654,000. When the Secretary of War and his aides made up their estimates for the new fiscal year beginning July 1, next, they put the total of all possible expenditures at \$7,732,914,000, including very considerable sums authorized as continuing appropriations because it was foreseen that they could not be entirely expended during the coming year. Before the House Military Committee could prepare the new budget, however, the estimates were raised more than \$4,000,000,000 to \$11,771,607,000. Of the amount carried by the bill just reported, \$9,583,349,808 is actually appropriated and contracts are authorized for the expenditure of \$2,458,332,801 to be appropriated hereafter.

The appropriations for the Ordnance Bureau naturally overshadow those of all other departments of the service except subsistence. The ordnance budget includes \$937,864,425 specifically appropriated and \$2,458,332,801 in contracts authorized to be made, making a total for the bureau of \$3,196,197,226. For the current expenses of the Ordnance Bureau in connection with purchasing, receiving, storing, and issuing ordnance and ordnance stores the sum of \$30,000,000 is appropriated. For the manufacture and purchase of ammunition for small arms for reserve supply the bill carries an appropriation of \$390,000,000 and authorizations for additional contracts aggregating \$706,486,991. For the manufacture and purchase of ammunition, targets, and other accessories for small arms and machine gun practice the sum of \$75,200,000 is appropriated and contracts are authorized aggregating \$84,073,725. For manufacturing, repairing, and procuring small arms at national armories the sum of \$50,000,000 is appropriated, together with authorizations for expenditures under contracts amounting to \$207,324,325. For overhauling and repairing ordnance and ordnance stores in the hands of troops and at the arsenals, posts, and depots, the bill appropriates \$93,400,000 with authority to make contracts aggregating \$350,299,260.

Increase in Use of Machine Guns

The great increase in the use of machine guns is reflected in the appropriation for the "purchase, manufacture, testing, repair, and maintenance of automatic

machine rifles or other automatic or semi-automatic guns, including their mounts, sights, and equipment, and the machinery necessary for their manufacture," which is put at \$237,144,000, and is supplemented by contract authorizations aggregating \$337,726,000. For the purchase, manufacture and repair of armored motor cars the bill carries \$75,550,000 with contract authorizations amounting to \$272,422,500, with the stipulation that these sums shall not be covered into the Treasury until the close of the fiscal year ending June 13, 1920.

In addition to the specific appropriations and authorizations for the Ordnance Bureau carried by the bill a blanket authorization is added empowering the Secretary of War to incur obligations for the purchase of ordnance and ordnance supplies not exceeding \$500,000,000. In order that the Ordnance Bureau may not be embarrassed in making contracts under the specific authorizations carried by the bill, a stipulation is added directly appropriating the sum of \$600,000,000 to be applied in the discretion of the Secretary of War to contracts made pursuant to authorizations.

Services of Experts

To enable the Chief of Ordnance to secure the services of experts who can not properly be classified within the clerical corps and to whom it is not desired to give commissions in the army the bill provides that services of persons other than military or clerical may be engaged and paid for out of the appropriations carried by the bill for designing, procuring, caring for and supplying ordnance and ordnance stores to the army.

To continue the vocational training of enlisted men with a view to enabling them to secure remunerative employment upon their discharge from the service, the bill carries the sum of \$75,000.

"While some mistakes and delays have occurred," says the committee in submitting this tremendous budget bill, "on the whole we think the country is to be congratulated that after little more than a year from the date of the declaration of war our country has constructed a wonderful military establishment."

It is significant that the army bill contains no prohibition against the use of scientific shop management methods in the manufacturing establishments of the Government. No explanation of this omission is offered by the committee, but it is expected that an attempt will be made on the floor of the House to force the customary rider into the army budget and that in case of failure the fight will be carried by the labor leaders to the Senate.

A Milwaukee Electric Steel Foundry Expands

The Maynard Electric Steel Casting Co., 716 Reed Street, Milwaukee, has broken ground on Twenty-second Avenue, near Cleveland Avenue and the Chicago and Northwestern railroad tracks, for a new electric steel foundry, with a daily capacity of 20 to 25 tons. The main building will be 86 x 250 ft., of reinforced concrete, steel and brick and will be ready within 60 to 70 days. The equipment will include a 3-ton Moore electric steel furnace; a 7½-ton electric crane, annealing furnaces, grinding wheels, sand blast equipment, etc., to be purchased at once. The present Rennerfelt electric furnace unit, producing 85 to 90 tons per month, together with the other equipment of the present foundry on Reed Street, will be transferred to the new plant. The old works already have been leased by the Globe Grey Iron Foundry, now located at 435 Howell Avenue, Milwaukee, and will be converted into a gray iron foundry as soon as it is vacated. The Maynard company originally operated a converter steel foundry, but for the past year or longer has made only electric steel.

In the Homestead Steel Works of the Carnegie Steel Co., Homestead, Pa., there are 9914 employees who subscribed a total of \$57,379 to the Red Cross drive, or an average of \$5.76 per man.

Mine Coal Handling and Storage Plant

The storage of coal by mine operators is being urged as a step toward the solution of the coal and car shortage problem for the reason that with the provision of storage space mine operators will not be delayed by a temporary scarcity of cars. It is stated that such storage has been favored by railroads for a long time, and the opinion is expressed that the operators will be compelled to adopt this plan because the scarcity of cars is likely to continue for some time.

The coal storage plant operated by W. Harvey Brown, Pittsburgh, and located at Alicia, Pa., is said to be the largest installation of the kind that has been provided by an operator. The fuel is brought down the Monongahela River on barges and unloaded with a coal-handling bridge and stored on the dock until needed. From the storage yard it is loaded directly on cars for the market or put on larries and sent to the coke ovens a short distance away. The bridge is 355 ft. long and

the cars in the tunnel, while loading by means of the bucket in the usual way. The coal handling plant was designed and erected by the Brown Hoisting Machinery Co., Cleveland.

The Red Cross in the South

BIRMINGHAM, ALA., May 27.—Birmingham's industrial captains put over the Red Cross drive during the week with the same efficiency marking the Liberty loan drive. Harry W. Coffin, vice-president of the Alabama Co., conducted the Liberty loan drive; Morris Bush, president of the Shelby Iron Co. and Imperial Coal Co., was chairman of the Red Cross drive. The mining field was handled by Charles F. De Bardeleben, general manager of the Alabama Fuel & Iron Co. The slogan of the campaign was "Give a Day's Work to the Red Cross." The Tennessee Coal, Iron & Railroad Co. made the largest donation, \$60,000; the Sloss-Sheffield Steel & Iron Co., \$50,000; the Gulf States Steel Co., \$5,000;



Coal Is Unloaded from River Barges by the Handling Bridge and Either Stored on the Dock or Loaded Directly on Railroad Cars, While the Tunnel Shown in the Insert Has Gates in Its Roof for Auxiliary Gravity Loading

has a cantilever 67 ft. long, extending over the river. Railroad tracks for loading run along the opposite end of the bridge. The trolley runs out over the cantilever for unloading, making the trolley travel 425 ft. The bridge is 110 ft. high to the trolley rail. This height makes it possible to store coal to a height of 55 ft., as compared with 35 or 40 ft., the usual height of a storage pile, and gives a storage capacity of 361 tons per lineal foot of dock. The bridge is equipped with a 6-ton clamshell bucket. Standard coal screening equipment is located in the pier at the loading end of the bridge. Coal can be screened and returned to the storage yard if desired and shipped out later.

The hoisting speed of the bucket is 250 ft. per min. with full load; the trolley travel 1000 ft. per min., and the bridge travel 160 ft. per min. The motor equipment includes a 25-hp. motor for hoisting, a 50-hp. motor for trolley travel, and a 100-hp. motor for moving the bridge on its runway.

In addition to the loading facilities provided by the bridge a railroad track runs under the storage yard in a tunnel, and cars are loaded in this tunnel from the coal piles above through gates operated by hand from the top of the cars. This increases the loading capacity of the plant as coal can also be loaded by gravity into

Alabama Co., \$1,000; American Cast Iron Pipe Co., \$1,000; Graselli Chemical Co., \$1,000; Woodward Iron Co., \$15,000; Republic Iron & Steel Co., \$5,000. The total ran over \$300,000 on an allotment of \$150,000, giving Birmingham another 200 per cent record. In this drive practically every mine worker, every mill and factory hand, every male and female worker, black and white participated. The miners alone gave \$40,000.

Hess Steel Corporation Starting More Furnaces

The Hess Steel Corporation, Baltimore, Md., has recently started up its third 6-ton Heroult electric furnace. Three more of the same size will soon be installed and when operating they will be used exclusively on a Government contract making a special alloy steel. The company is very busy rolling all kinds of plain carbon and alloy steels into squares and rounds up to 6-in. bars. A special alloy steel containing about 5 per cent of nickel and very low in carbon has been made, in the production of which it was necessary to use carbon less ferromanganese to secure this low carbon. The demand for all grades of alloy steels is large and insistent and the company is operating almost exclusively on Government orders.

To Stop Competitive Bidding for Labor

How the 400 Government Employment Offices Will Help in Securing Workmen—Labor Turnover Meeting of American Society of Mechanical Engineers

COMPETITIVE bidding for labor and independent labor recruiting by the war industries in this country is going to be stopped by order of the Government, according to J. B. Densmore, director of the U. S. Employment Service of the Department of Labor, who addressed a meeting in New York on May 21 of the American Society of Mechanical Engineers. The topic of the meeting was "Labor Turnover" and a number of addresses were made by industrialists who have been studying the problem and by representatives of the Government. "There are a few preliminaries," Mr. Densmore said, "which must be taken care of before the whole machinery necessary can be arranged and announced." The War Policies Board, which is the official title of the Labor Administration Board, will, it appears, have absolute authority over everything concerning labor and production and will shortly issue orders that war industries of the country must take their supply of labor through the Government. He intimated that an offending employer will be so compelled by some process executed by the War Industries Board or by the Capital Issues Committee or some other division of the Government. At the present time about 400 employment offices have been established in the big cities of the country and others are being installed in the smaller cities and agents are being attached to these offices to recruit within a definite radius both skilled and common labor.

Classification of Trades

One of the addresses was made by J. J. Swan of the committee on classification of personnel in the army, which has among other duties the allocation of skilled tradesmen throughout the army and indirectly the education of some 100,000 men in the trades. All the trades in the army have been analyzed and a list has been compiled in a book of specifications of trades, some 565 of them. This book gives the duties and qualifications, so that all those who have to handle lists, like those in the local boards in connection with the draft or in the local offices of the employment service of the Department of Labor, will classify men according to the same specifications. The result then is that when men of stated qualifications are necessary a list of them may be obtained according to the classifying system. If such men are not available, those listed under a substitute occupation may be ascertained. The book of trades in short also compiles substitute occupations for all of the 565 tabulated. The book is alphabetically arranged with an index covering the trades and there is a cable code index for foreign communication when a demand arises abroad.

Telegraphic Clearance of Labor Conditions

Following out of this the Labor Department has undertaken the standardization of the munitions trades and shipbuilding trades. There will be specifications of the jobs and standardized names and finally a standard for each particular job. The plan then is that a telegraphic clearance of labor conditions may be maintained throughout the country as is the case with the weather bureau. Thus if a given manufacturing company wants 500 machinists, it would communicate with the nearest office of the employment service and if that office has not definite information at hand, it gets in touch by wire with Washington and the entire labor situation becomes known and the men are obtained without disturbing industrial conditions.

In the matter of education, the Government has instituted a series of trade schools. Some 55 are in actual operation and ultimately there will be 100, and

in the course of the next ten months there will be over 100,000 taken out of these schools on the basis of eight weeks' training course. The men are actually enlisted in the army and under Government pay while at school, and as they leave the school they will be assigned to places in the army where their training is desired.

The other Government representatives were H. E. Miles of the committee on industrial training of the Council of National Defense, who contended that labor turnover is a symptom and not a disease and that the reason for it is defective management, and Maj. E. N. Sanctuary of the War Service Exchange of the Adjutant General's office, who told how an effort is being made to utilize the number of men who on final physical examination have been found unable to go across the ocean, the idea being to find a place for these men in the army and thus to conserve the manpower of the country, such as supplying several scores of draftsmen to the Ordnance Department made up of those who would not be qualified to serve with combatant troops.

Committee on Labor Turnover

The meeting was presided over by George R. Woods, assistant to the president Allied Machinery Co. of America. James J. Pearson, late of the British Ministry of Munitions Service; Orrin W. Sanderson, director of labor, B. F. Goodrich Co., Akron, Ohio; Dudley Kennedy, American International Shipbuilding Corporation, and formerly with the Goodrich company; H. F. J. Porter, consulting industrial engineer, New York; John Calder, Aeromarine Plane & Motor Co., Keyport, N. J.; Capt. Boyd Fisher, Ordnance Department, U. S. A., and Luther D. Burlingame, industrial superintendent, Brown & Sharpe Mfg. Co., were among the other speakers. The upshot of the meeting was that it was voted that a committee be appointed to take immediate action to determine how the society can render the greatest assistance in the solution of the problem of labor turnover.

Mr. Sanderson described the different departments and specialists employed for meeting the conditions arising in connection with a body of employees totaling more than 20,000. Mr. Kennedy told how at the Hog Island yard there were 2000 employees on Nov. 1 and on Jan. 1, 26,700. To get that complement of men they had to employ 130,000 men in six months. "Nobody," he said, "has ever before tackled such a job. The yard is seven miles from Philadelphia, and a mile and a half from the nearest means of transportation. Our commissary department fed in January 376,192 meals. We fed as high as 17,000 meals in one day. We had five weeks when the weather never went above freezing and we had no shelter and no houses except commissary bunk houses."

Keeping the Skilled Man from the Draft

Mr. Calder emphasized that in every plant some one with the supervision of the chief executive should take a census of employees, thus to obtain information for enlightening the selective draft boards. "Most employers have erred," he said, "in not recognizing how little the average worker knows about filling out forms intelligently. Workmen unintentionally make claims that cannot be supported and in many cases fail to make the most of their status. Otherwise," he pointed out, "men more valuable in industry than in the army will be taken to the training camps."

He referred to a suggestion made a month ago by a representative of the Secretary of the Navy that munition workers could be enthused by periodic 30-min. talks by competent inspirationalists accompanied by un-

censored motion pictures of sea and land from the front. It was not yet in effect and 30 min. once a month on full pay would be a small price to pay for the results obtainable.

Captain Fisher told of the schools for employment managers instituted under the direction of the Government and referred also to the work of Administrator of Labor Frankfurter.

Mr. Burlingame touched on the turnover as affecting women employees in the plant of the Brown & Sharpe Mfg. Co. A smaller percentage of women were discharged for reasons of discipline than of men, but a larger percentage were discharged for lateness and absence. Among those leaving voluntarily, the percentage of women leaving on account of poor health was greater than among men, this applying also in the matter of a change of vocation.

Manufacturers Oppose Metric System

The National Association of Manufacturers at the convention in New York last week, adopted resolutions condemning the recent revival of agitation to introduce the metric system into the United States.

The resolutions follow:

Whereas, The agitation for the adoption of the metric system has been again revived and is being vigorously conducted, and

Whereas, The British Committee on Commercial and Industrial Policy After the War has made an exhaustive analysis of this question, and concludes in language as follows: "We are not convinced that the metric system is upon the whole even theoretically superior to the British system, and we are satisfied that the practical objections to the proposed change are such as to decisively outweigh any advantages which are claimed for it"; therefore, be it

Resolved, That we regard the agitation for the establishment of the metric system as particularly untimely because of war taxation on manufacture, and because under present conditions the overwhelming activity of manufacturers in war work makes proper consideration of such a subject impossible. It is further

Resolved, that we endorse the work of the American Institute of Weights and Measures in opposing the adoption of the metric system.

Frederick A. Halsey, commissioner of the American Institute of Weights and Measures, said he was pleased that the association had taken this stand.

Officers elected by the association for the coming year are: Stephen C. Mason, president; J. Philip Bird, general manager and assistant treasurer; Henry Abbott, treasurer, and George C. Boudinot, secretary.

Price of Coal Reduced

WASHINGTON, May 28.—A cut of 10 cents per ton in the price of bituminous coal, effective at 7 a. m. May 25, has been ordered by Fuel Administrator Garfield. This reduction, which represents an average cut of approximately 5 per cent, has been made because of certain advantages accorded the coal operators through the installation of the new system of "open car supply" by the Railroad Administration, which is counted upon to effect very substantial economies in the mining and shipping of coal.

In making this cut in the price of bituminous coal, Dr. Garfield has again scored a point over John Skelton Williams, in charge of the purchasing division of the Railroad Administration. Mr. Williams has insisted that the railroads, because they are the property of the people, are entitled to a preferential rate for the 130,000,000 tons of coal annually consumed by them and, as heretofore described in this correspondence, recently undertook to secure the establishment of a preferential price of cost plus 10 cents per ton. This would have effected a saving in the coal bill of the railroads of about \$40,000,000, but Dr. Garfield declined to authorize any preference whatever, holding that all consumers, including the railroads, should be on the same footing, a contention in which he was upheld by the President. The reduction will mean an annual saving to consumers of a sum estimated by the fuel administration at \$60,000,000.

EIGHTY PER CENT TO WAR NEEDS

First Pig-Iron Reports Indicate a Large Percentage Going to Essentials

That about 80 per cent of the pig iron of the country is being consumed by the Government and its Allies, and in various industries classed as war essentials, is indicated by some of the earlier reports that have come to pig iron producers from customers in reply to the questionnaire sent out under the direction of the Pig Iron, Iron Ore and Lake Transportation Committee of the American Iron and Steel Institute. Reports are just beginning to reach this committee. Many of the furnaces have not yet received returns from more than one-half of their trade, and many of the returns are incomplete and have to be returned. The furnaces will be unable to report until they have complete returns.

Reports received by two Central Western furnaces making basic, malleable and foundry iron, one supplying the Central Western trade and the other finding its market largely in the East, are interesting in that they are believed to show fairly well how the output of iron is being distributed for Government work, railroad work and other essential industries, and for miscellaneous requirements covering the less essential industries. The data given below are tabulated from returns of 75 per cent of the customers of the two producers. The figures of one of the producers quoted are based on a total pig iron consumption by the consumers reporting of 387,666 tons from May 1 to Jan. 1, 266,660 tons of which is basic and malleable and 121,006 tons foundry iron. The figures show the following percentages of the three grades used for work for the various Government departments directly and indirectly and for other industries:

	Per Cent
Emergency Fleet Corporation.....	3
Navy Department	3
War Department	18
Allied Governments	7
Railroad Work	14
Other Government Work.....	11
Agricultural Implements	17
Mine Supplies, Oil Well Machinery, etc.....	1
Machine Tools	5
Miscellaneous	21

Reports received by the furnace companies supplying the Eastern trade cover consumers of 314,484 tons of iron from May 1 to Jan. 1, 249,120 tons of which is basic and malleable and 65,364 tons foundry iron. The distribution of this iron among the various classes of castings by these consumers is as follows in percentages:

	Per Cent
Emergency Fleet Corporation.....	5
Navy Department	5
War Department	23
Allied Governments	14
Railroad Work	12
Other Government Work.....	10
Agricultural Implements	6
Mine Supplies, Oil Well Machinery, etc.....	4
Machine Tools	3
Miscellaneous	18

The reports of the two furnaces indicate that the consumers will need about 10 per cent more iron for the remainder of the year than they have already purchased. The consumers supplied by the Western producer report that their additional requirements for the remainder of the year will amount to 38,076 tons, and the consumers, largely in the East, that are supplied by the second producer report that their additional requirements amount to 35,537 tons.

The pig iron committee has decided that it will not ask non-merchant furnaces to make complete reports of the final disposition of their iron. This is regarded as unnecessary, as the Government is securing complete information as to the distribution of every ton of steel into which this iron goes.

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Helping the Coal Supply

It is every one's duty to help the coal supply. Two services can be rendered almost universally, to stock coal and to apply pressure that the coal mined and shipped be the best grade the mine can produce. Efforts should be unremitting; but at this particular time there should be the greatest effort, for it is now that the special opportunity is afforded.

It would be an egregious blunder to assume that the improvement now felt in coal supplies is the work of man. It is the work of nature, in bringing spring weather. It remains the fact that coal supply means transportation. There is no basis for assuming that the most enlightened and energetic federal control of the railroads will produce an entirely adequate supply of transportation for the country in this war time. At the best there is certain to be some deficit.

The deficit in transportation that is certain to continue indefinitely may be better realized if certain misapprehensions as to what occurred last winter are dismissed. From a variety of causes the amount of transportation the railroads actually carried on last January and February was underestimated in the popular mind. Much had been said about how the Interstate Commerce Commission had "starved" the railroads for a period of years, whereby the idea of the railroads ceasing to function was made to seem quite natural. There were startling cases of freight being an unconscionable time in transit, and of some tracks being absolutely blockaded. The transition from such a supposed condition to the present condition of an apparently fairly free movement of freight would naturally suggest that the railroad situation had been righted, largely by the work of man, and that as further steps are taken, in the buying of cars and locomotives, the improvement of terminals and the adoption of new methods in utilizing the physical facilities of the railroads, the possibility of a recurrence of last winter's difficulties is being made remote.

This is not the correct view. Apart from certain local and very important cases of congestion, the bad conditions of last winter were not due so much to the railroads moving an abnormally small

quantity of freight as they were due to there being an abnormally large quantity of freight calling for movement. A great deal more is required of the railroads in these war times than is required in peace times with the most active industrial conditions. Statistics have become available showing the ton-mileage actually moved on the railroads in the first two months of the year. In January, when the majority of the railroads were supposed to be blockaded, there was a movement at the rate of about 300 billion ton-miles a year. That was just equal to the average rate in the fiscal year 1913, and it exceeded the best rate in any other year prior to the fiscal year 1916. Obviously, therefore, a great deal of freight really was moved last January. Nevertheless, the movement was just two-thirds as great as the movement in the preceding June, when a maximum had been reached. In February the movement was about 20 per cent greater than in January, whereby the rate was actually greater than in any fiscal or calendar year prior to the calendar year 1916, and approximately 20 per cent greater than in any year prior to the fiscal year 1916.

These comparisons are sufficient to show that however inadequate the railroad movement was in the first two months of the year, the difficulty lay more with the inordinate demands upon the railroads than with their inability to move freight. The opposite view, entertained in many quarters, tends to produce a feeling of security that things are going to be managed right in future and that therefore there will be no more serious traffic difficulties and no recurrence of a coal famine. Such a viewpoint is directly harmful. It should be dismissed and the view taken that no effort can be too great in the direction of endeavoring to avoid a fuel famine next winter.

The Railroad Administration is endeavoring to improve traffic conditions and the Fuel Administration is endeavoring to improve coal conditions. Doubtless the efforts are wisely directed, though there are many who think the methods could be improved upon and more strenuous means taken to reduce the difficulties. Whatever be the true appraisal of these official efforts, the duty of the individual is not affected. Too many efforts cannot be made, and it therefore behooves the coal con-

sumer to exhaust his resources in two directions, in the stocking of coal and in the insistence upon quality. The expense of stocking coal is a very small item measured against the loss caused by a shortage and but little attention should be paid to expense.

As to quality of coal, every pound of slate shipped keeps off the railroads a pound of coal, and that will be the case for an indefinite period. Used for power and heating furnaces, the foreign matter decreases the calorific value of the coal by an amount much in excess of the coal it displaces, and it also involves labor, and in some cases railroad facilities, in removing the ashes. Used in coke manufacture it is particularly expensive because apart from the direct loss there is an increase in the amount of limestone that must be used in the blast furnace.

The coal consumer serves the general cause as well as his own interest when he objects to receiving coal of poor quality. The Fuel Administration has given ample evidence that it will support all legitimate claims as to poor quality of coal. The matter is well understood in Washington, and indeed it was no other than the Director of Mines who first called general attention to the fact that one of the great causes of the coal shortage in 1917 was the large amount of foreign matter, chiefly slate, that had been shipped as coal. That was months ago and the Fuel Administration has meanwhile taken many measures to improve the quality of coal. The consumer who receives poor coal should feel assured of full support by the authorities when he complains of the quality.

There should, therefore, be unremitting effort on the part of all connected with the production, distribution and consumption of coal that every ton possible be shipped now and through the summer and fall, and that every ton be of the best quality possible. The railroads may do much better in future, but the demands upon them are so unprecedentedly great, so much in excess of the requirements even in the most active of peace times, that there is no hope of any excess in transportation facilities. Conservation of existing facilities, however great those facilities may be, is imperative.

Practical Patriotism

Evidence that American business men are not only declaring their loyalty to the Government in the most emphatic manner but also are working diligently to serve their country in the most practical and efficient way, is being presented in many places, particularly at conventions and other gatherings. It is easy to indulge in patriotic expressions and make spread-eagle speeches, but often it is difficult to work out definite methods of helping to win the war.

At the meeting of the American Iron, Steel and Heavy Hardware Association at Atlantic City last week, the members definitely pledged themselves and their companies to sell steel, first, for the requirements direct and indirect of the United States Government and, second, for such essential uses as may be directed by the priority committee of the War Industries Board. A valuable report on

the steel situation as it affects the jobbers was read by S. L. Orr, Evansville, Ind., chairman of the War Service Committee of the association who, in very emphatic language described what he believed to be the duty which now confronts the members. He declared that they must make it their business conscientiously to apply the priority test to all sales and ask, Is this material necessary and essential in helping to win the war? Will the priority committee look at it as essential to winning the war?

Likewise at the Pittsburgh meeting of the American Board of Scrap Iron Dealers last week, highly patriotic sentiment prevailed and the speeches, particularly those of the president, Mr. Shroder, and W. Vernon Phillips, chairman of the Sub-Committee on Scrap Iron and Steel of the American Iron and Steel Institute, pointed the way for the rendering of highly important service. We have seen no finer expression of patriotism in business than that of Mr. Phillips, who described the methods by which, in his opinion, the scrap dealers of the country can serve most effectively. Mr. Phillips's statement that an order is about to be given for 750,000 cots for wounded soldiers and that every one of the cots will be made from scrap, indicates how closely this business is connected with the war. To increase the production of scrap is so extremely important that the humblest individual who goes about the country picking up pieces of waste material which can be used in making iron or steel is helping in no mean way to win this war.

Alloy Steel Castings vs. Forgings

An important future is predicted for a new class of electric steel furnace products. President Flinterman of the Michigan Steel Casting Co., Detroit, in a paper on "Electrical Steel Castings" at the recent meeting of the American Electrochemical Society, abstracted in this issue of THE IRON AGE, not only predicted but advocated the use of heat-treated electric alloy steel castings in place of various kinds of forgings. Such castings are now actually replacing forgings to some extent in the automobile and other fields. Some of the properties of heat-treated alloy castings, with an elastic ratio of 80 per cent, to which the author calls attention, are interesting and striking but not at all unexpected. In fact, some years ago the excellent results of certain large open-hearth alloy castings were referred to in articles in THE IRON AGE—"Use of Vanadium in Steel Castings," Sept. 19, 1912, and "The Properties of Nickel Cast Steel," Aug. 8, 1912. It was shown that an elastic ratio of 70 per cent was regularly obtained from annealed castings. If unusual results are obtainable from simple annealed open-hearth castings, much more may be expected from electric furnace castings, as Mr. Flinterman shows by his own experience in meeting present Government specifications.

There is no reason why heat-treated electric alloy castings should not attain a wide use in place of certain forgings. It is not many years ago that nothing was heard of a steel casting as

an important part of a locomotive or a battleship. To-day annealed plain carbon castings of open-hearth steel are almost exclusively used as frames, stern posts and in other vital parts of locomotives and ships. There is more reason why similar success should result from heat-treated alloy castings. Not only is the electric furnace able to produce a high-grade uniform metal but modern heat-treating appliances, especially electric, are such that a highly perfected product is more nearly possible than ever before. Added to this is the wonderful supply of ferroalloys and alloys now available, likewise electrical products, making possible the production of many combinations of metals. Because of the possibility of obtaining special alloys, an electric steel producer is now able to make a very low-carbon high-nickel steel—a prophecy of other similar products in this field which has so rich a future.

New Steel from Old

Not so long ago the possibility of making new or good steel solely from old steel or scrap, without the addition of virgin metal as pig iron, was regarded as a dream, at least so far as any commercial aspect was concerned. But there is no longer anything unusual about this. The electric furnace has revolutionized our ideas of this as well as of some other metallurgical phases of the steel industry. To-day, steel of the best quality is made in large units from scrap of poor quality and from scrap alone, in such furnaces. Even old steel is almost magically reconverted into excellent pig iron, something that would have been considered chimerical if suggested ten years ago.

Something similar to this achievement of the electric furnace is now being accomplished on a large scale in the open-hearth. In two instances, one in Canada and one in the United States, heats as large as 25 tons are being made where 95 per cent of scrap steel, mostly shell turnings, is the charge. While about 5 per cent of pig iron is used in one case, in the other none or very little has been employed, but instead petroleum coke has furnished the necessary carbon. It is understood that good steel has been the product in each case, the process involved being acid, and the product cast-steel shell blanks. The procedure has been nearly normal, and very little time has been lost because of the unusual practice. This condition has been largely forced because of the difficulty in obtaining low-phosphorus pig iron and because of the abundance of shell and other turnings.

Necessity is again the mother of invention. War necessity certainly has opened the way to results hitherto regarded impossible.

Still another instance of introspection on the part of the British is indicated in the report of the committee appointed by the Government to consider post-war commerce and industrial progress. The conclusion as to iron and steel is that the relatively stationary condition of the industry in respect to production and its declining position in the world's trade is due in part to the deficiencies of natural

resources in iron ore, but primarily to the more modern character, better organization and greater efficiency of the German and American industries. The committee suggests the creation of combinations for the control of domestic sales as well as export business, and believes that combinations of employers are beneficial to the workers in the trade affected, in respect to wage rates, steadiness of employment and other matters. It considers a tariff on iron and steel and non-ferrous metals, among other things, a necessity, but is opposed to a tariff on the cotton and shipbuilding industries. It is opposed to the compulsory adoption of the metric system.

The Greatest Flag Day

June 14 this year promises to be the greatest flag day in the history of the American Republic. Never have the people of the United States had so much reason for honoring their flag and for encouraging all men to love it.

The National Americanization Committee, Engineering Societies Building, New York, is making a special effort to encourage manufacturers to help in the celebration of flag day. In a page announcement, which THE IRON AGE publishes in this issue, as its contribution to the cause, there is a suggested flag day program prepared by the committee for celebration at industrial plants in the noon hour of Friday, June 14. This program includes flag raising, salute to the flag, the saying of "America's Creed," addresses and the singing of patriotic songs, all under the supervision of a committee of employers and employees, with foreign-born men represented. The Bureau of Education, Washington, has issued a letter to employers of foreign-born workingmen, in which it says:

For the first time in the history of America the flag is being carried in foreign countries by legions of fighting Americans.

For the first time men of all nationalities who have adopted America as their country are banded together under the flag, in foreign lands.

There are many thousands of workers of many races in America who have those near and dear to them in these ranks, and who are working in American industrial plants to help win the war. They would welcome the opportunity to join with older Americans in paying tribute to our flag and in pledging loyalty to the great cause for which we are all fighting.

Flag Day offers a splendid opportunity for all of the workers in your plant to get together for a little ceremony of flag raising, with a simple program which will go far toward bringing about a better understanding of the war and unity behind the war, and will also strengthen the right spirit in your plant needed for war.

Naturally, celebrations will differ in different localities, but the suggested program, we believe, will be of service anywhere in industrial centers. Experience has demonstrated that the Americanization of foreigners and the inspiring of workmen to greater enthusiasm for the winning of the war promote efficiency, which means increased supplies for our Army and those of our Allies. The efforts of the Americanization Committee and Bureau of Education should find hearty response from employers and employees alike throughout the country.

SWEEPING FREIGHT ADVANCES

New Rates on Iron Ore, Coal and Coke—Increase in Income \$850,000,000

WASHINGTON, May 28.—In a sweeping order, Director General of Railroads McAdoo has advanced all freight rates approximately 25 per cent and passenger rates nearly 50 per cent. The increased freight rates are to become effective June 25 and cover both interstate and intrastate traffic. It is estimated that the new tariffs will result in a total increase in the income of the railroads exceeding \$850,000,000 per annum.

In framing the new rate schedule the director general advances class rates 25 per cent and provides for the cancellation of all class rates less than 25 cents first class and proportionate rates on other classes. The 25 per cent increase will apply also on commodity rates generally, except the commodities of which there is a heavy movement on which the advances will be made by adding certain amounts to all rates or by fixing specifically the new rates which shall apply.

Following are the new tariffs on coal, coke and iron ore:

Where rate per ton is: *Coal*

0 to 49c.....	Increase 15c. per net ton of 2000 lb.
50 to 99c.....	Increase 20c. per net ton of 2000 lb.
\$1 to \$1.99.....	Increase 30c. per net ton of 2000 lb.
\$2 to \$2.99.....	Increase 40c. per net ton of 2000 lb.
\$3 or higher.....	Increase 50c. per net ton of 2000 lb.

Where rates have not been increased since June 1, 1917, the increase to be made now shall be determined by first adding to the present rate 15c. per ton, net or gross as rated, or if an increase of less than 15c. per ton, net or gross as rated, has been made since that date, then by first adding to the present rate the difference between the amount of that increase and 15c. per ton, net or gross as rated; and to the rates so constructed the above increases shall now be added.

Where rates from producing points or to destinations have been based on fixed differentials in cents per ton, such differentials to be maintained, the increase to be figured on the highest rated point or group.

Where rate per ton is: *Coke*

0 to 49c.....	Increase 15c. per net ton of 2000 lb.
50 to 99c.....	Increase 25c. per net ton of 2000 lb.
\$1 to \$1.99.....	Increase 40c. per net ton of 2000 lb.
\$2 to \$2.99.....	Increase 60c. per net ton of 2000 lb.
\$3 or higher.....	Increase 75c. per net ton of 2000 lb.

Where rates have not been increased since June 1, 1917, the increase to be made now shall be determined by first adding to the present rate 15c. per ton, net or gross as rated, or if an increase of less than 15c. per ton, net or gross as rated, has been made since that date, then by first adding to the present rate the difference between the amount of that increase and 15c. per ton, net or gross as rated; and to the rates so constructed the above increases shall now be added.

Where rates from producing points or to destinations have been based on fixed differentials in cents per ton, such differentials to be maintained, the increase to be figured on the highest rated point or group.

Iron Ores

Increase 30c. per net ton of 2000 lb., except that no increase shall be made in rates on ex-Lake ore that has paid one increased rail rate before reaching lake vessel.

Copper bullion and smelter products will be advanced to approximately \$6.50 per ton from the Rocky Mountains and Pacific coast states to the Atlantic seaboard. All export and import rates will be cancelled, the domestic rates applying to and from the ports. The minimum charge for handling a less-than-carload shipment will be 50c. and for road-hauling a carload the minimum will be \$15. The important established rate groupings and fixed differentials will be continued where found practicable even though through rates resulting from their use may be lower or higher than the exact percentages named in the order.

The passenger fare increases, which approximate 50 per cent, are obtained by raising all rates on June 10 to a flat 3c. per mile. There are a few exceptions in the sparsely settled sections where the present fares are somewhat higher than 3c.; these will not be disturbed but all fares on a lower basis will be advanced to 3c. In addition to present charges made for stand-

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ard sleeping car and parlor car accommodations an additional fare of ½c. per mile will be charged, while an increase of ¼c. per mile will be levied on persons traveling in tourists' sleeping cars. Commutation fares are not included in the general increase but will be advanced 10 per cent. Fares on the water lines under Government control will be advanced proportionately.

In a statement explaining the new tariffs and the reasons for their adoption Director General McAdoo says that because of heavy increases in operating costs, the chief items being labor, advanced \$300,000,000, and fuel, advanced \$350,000,000, it is estimated that during 1918 for the same amount of business as that handled last year the cost of operating the railroads will exceed by from \$830,000,000 to \$860,000,000 that for the calendar year 1917.

Large Attendance at Institute Meeting Assured

The meeting of the American Iron and Steel Institute to be held at the Waldorf-Astoria Friday of this week promises to make a new record for attendance, as about 850 applications for tickets to the banquet Friday night have been received. The meeting will be opened Friday morning, as usual, by an address of the president, Elbert H. Gary, and the reading and discussion of papers, as heretofore announced, will take place. The paper by Bertram S. Stephenson, resident manager M. A. Hanna & Co., Pittsburgh, on the "Relation of Trade Papers to the Iron and Steel Industry," will be discussed by James R. Mills, district sales manager Carnegie Steel Co., Cleveland, and by A. O. Backert, vice-president Penton Publishing Co., Cleveland.

Prices of Car Castings

Manufacturers of malleable castings and a subcommittee of the General Advisory Railroad Purchasing Committee are understood to have agreed on prices for car castings, including malleables and steel castings, but the price schedule has not been approved by the American Iron and Steel Institute, and neither the institute nor the Railroad Administration is ready to make any announcement concerning the matter, although certain prices purporting to be official have been published.

PERSONAL

M. C. Robbins has resigned as general manager and director of THE IRON AGE and has secured control



M. C. ROBBINS

of the *Gas Age* and Brown's Directory of American Gas Companies through the purchase of the stock of the Progressive Age Publishing Co., New York, of which he will be president and treasurer. The purchase was made from E. C. Brown, who has been the sole owner of this property for more than 30 years. Mr. Brown retains a substantial interest in the business and will continue as editor of the *Gas Age*, which is a semi-monthly periodical in its thirty-fifth year, devoted to both the technical and commercial sides of the artificial and natural gas industry. Brown's Directory, which was first issued in 1887, is not only a directory of the gas business, but is replete with statistical data. It is published annually and contains about 1000 pages. The publication offices are at 52 Vanderbilt Avenue, New York. Mr. Robbins is a civil engineer by education and served eight years on the staff of the *Engineering News* as manager of the western office in Chicago. He joined THE IRON AGE seven and one-half years ago and has a large acquaintance among its constituents.

Marvin A. Neeland, president New York Shipbuilding Corporation, formerly chief engineer of the United States Steel Corporation, was presented by the board of directors with a silver loving-cup as a souvenir of his part in the building of the record ship Tuckahoe, which was launched 27 days, delivered 37 days and sailed with her first cargo 40 days after her keel was laid. The cup bears the inscription, "To the leader of the men who built the Tuckahoe and showed in a time of national need what American shipbuilders could do for their country."

Bent L. Weaver, superintendent of the steel foundry department of the Steelton, Pa., plant of the Bethlehem Steel Corporation, has resigned to take charge of the locomotive plant of the Vulcan Iron Works at Wilkes-Barre, Pa. He will assume his new duties June 1. Mr. Weaver has been connected with the operation of the steel works for nearly 25 years. Previous to taking charge of the steel foundry, he held the position as assistant to the superintendent of the frog, switch and signal department.

C. H. Froelich, for three and one-half years in charge of designing field artillery at the Bethlehem, Pa., plant of the Bethlehem Steel Corporation, has been commissioned a major in the Ordnance Reserve Corps of the United States Army.

August Mertes, for several years superintendent of the works of the Pittsburgh Machine Tool Co., Brad-dock, Pa., has resigned to accept a similar position with the Bradney Machine Co., Middletown, N. Y., builder of locomotive cranes, elevating machinery and machine shop tools. James Weeks, formerly with the Union Switch & Signal Co., has been appointed his successor.

Charles A. Adams has recently completed 50 years' service with the John B. Varick Co., Manchester, N. H. For 43 years he has been manager of this hardware jobbing house. He has been presented by Thomas Rice Varick and Richard Varick in commemoration of this business record with a solid silver service of five

pieces, with a kettle to match and a solid silver server. He was also the recipient of a gold watch and chain from the New England Iron and Hardware Association of which he has been president for the past two years. Mr. Adams is also president of the Elliot Mfg. Co. of Manchester.

M. C. Turpin, formerly assistant to manager, Westinghouse Department of Publicity, Pittsburgh, has resigned to enter Federal service as assistant to manager, technical publicity bureau, Ordnance Department. His work will be on the dissemination of information from the War Department to manufacturers through the medium of the trade press. He is a graduate of Alabama Polytechnic Institute and of Cornell University. After several years' experience in the construction and operation of central station plants, he entered the Westinghouse Department of Publicity in 1909. He is an associate member of the American Institute of Electrical Engineers and the National Electric Lamp Association, and a member of the Pittsburgh Press Club, the Pittsburgh Ad Club, and the Illuminating Engineering Society.

W. P. F. Ayer, vice-president of the Walworth Mfg. Co., Boston, was one of the speakers at the annual meeting of the National Pipe and Supplies Association at Cleveland, May 13 and 14. His address covered present conditions in the fittings and valve industry.

V. F. Signorelli, formerly secretary and assistant treasurer of the Southwark Foundry & Machine Co., Philadelphia, is now office manager and auditor of the Foundation Co.-Carpenter-Watkins, Inc., Brunswick, Ga. This company is building barges for the U. S. Navy and has on hand contracts for several 2500-ton wooden vessels.

William C. Sproul, who was nominated last week for Governor of Pennsylvania by a majority of about 225,-



W. C. SPROUL

000 over his closest competitor in the largest primary vote ever given in that State, has been actively identified with the steel business and other large industries for many years. In 1910 he organized the Seaboard Steel Casting Co., Chester, Pa., of which he was president until its amalgamation with the Penn works in the Penn Seaboard Steel Corporation, of which he is now a director and a member of the executive committee. In 1909 with a number of associates he organized the General Refractories Co. which is engaged in the making of firebrick in Pennsylvania and several other states.

Senator Sproul is president of the company and also of the Lebanon Valley Iron & Steel Co., whose plants are at Lebanon and Duncannon, Pa. In 1916 he purchased the old established Robert Wetherill & Co. works in Chester, Pa., and turned it over to the Sun Shipbuilding Co. in which he retains a large interest and is a director. He is also interested in banking, insurance and other business enterprises. He is a graduate of Swarthmore College and a member of the Phi Kappa Psi fraternity.

At a recent meeting of the Naval Consulting Board, D. W. Brunton, consulting mining engineer, Denver, Col., was elected a member. Mr. Brunton has been connected with some of the most important tunneling propositions in the country, such as the Laramie Poudre Irrigation Tunnel and the Cripple Creek Drainage Tunnel.

Thomas R. Brown, engineer, Pittsburgh, was recently appointed administrative engineer for the Fuel Administration. C. P. Billings was made special staff assistant. These appointments are in connection with

the program for fuel conservation through economies in operation methods.

W. N. Dickinson, president Standard Plunger Elevator Co., Worcester, Mass., has resigned to join the progress section of the control bureau, Ordnance Department, U. S. A., Sixth and B streets, Washington.

Philip T. King, assistant sales manager for J. N. Kinney, 30 Church Street, New York, locomotive and traveling cranes, has joined the national service and leaves this week to take up his new duties.

George W. Agerter, formerly with the Hunter Saw & Machine Co., and later with the Pittsburgh Saw & Mfg. Co., is now connected with the Ludlum Steel Co., Watervliet, N. Y., and will represent the company in the Pittsburgh district in the sale of its tool steels. Mr. Agerter has been at the plant of the company for a month or more, taking a training in the manufacture of electric steel and its treatment.

J. H. Hillman, Jr., president of J. H. Hillman & Sons Co., Oliver Building, Pittsburgh, large producer of coal and coke, has been elected a director of the People's Savings & Trust Co., that city.

A. C. Burch, president of the Signal Motor Truck Co., Detroit, has resigned.

John Parker, formerly efficiency engineer of the Cincinnati-Bickford Tool Co., has joined the Spencer-Smith Machine Co., Howell, Mich., as factory manager.

Dean Herman Schneider of the University of Cincinnati, who has been in charge of the Industrial Service Section, Army Ordnance Department, Washington, has been promoted to Assistant Chief of Army Ordnance.

Harry Zimmerman, chief clerk of the Wellston Iron Furnace Co., Jackson, Ohio, has resigned to enter the navy. On the eve of his departure he was tendered a banquet by his fellow employees and officers of the company, at which S. E. Stephenson, general manager, presided.

Leslie L. Newton, secretary and sales manager Luther Grinder Mfg. Co., Milwaukee, has resigned to accept the position of secretary-treasurer and general manager of the Stegeman Motor Car Co., 606 Linus Street, Milwaukee, manufacturer of motor trucks.

S. W. Platt has been appointed district sales manager and W. E. Gilbert traffic manager of the Pittsburgh office of Luria Brothers & Co., dealers in iron and steel scrap, Park Building. On June 1 the offices of this company will be removed to rooms 934-936 Oliver Building, Pittsburgh.

H. V. Jamison, advertising manager of the American Sheet & Tin Plate Co., Frick Building, Pittsburgh, has been elected president of the Pittsburgh Advertising Club, succeeding J. C. McQuiston, manager of the Westinghouse Department of Publicity, East Pittsburgh, whose term had expired. W. G. Evans of the Harris Pump & Supply Co., is secretary of the organization.

Harry Resnick, formerly district sales manager of Luria Brothers & Co., dealers in iron and steel scrap, Park Building, Pittsburgh, is now connected with Bialosky Brothers & Co., Cleveland, dealers in iron and steel scrap.

A. W. Milligan has resigned as general foreman of Section B of the Westinghouse Electric & Mfg. Co., East Pittsburgh, to accept a position with the Canadian Westinghouse Co., Ltd. He was presented a gold watch by the Bowling League of the Westinghouse Club.

The Dillon Crucible Alloys, Ltd., Welland, Ont., has been incorporated with a capital stock of \$100,000 by Lynn B. Spencer, Lorenzo C. Raymond, Charles Henderson and others to manufacture crucible steel, alloy steel, iron, machinery, etc.

The Stalnaker Steel Co. has opened branch offices at 1407 and 1408 Singer Building, New York, to take care of its business in the East. E. S. Edwards is in charge.

New Koppers Coke Oven Contracts

The H. Koppers Co. has been awarded a contract by the Jones & Laughlin Steel Co. for the construction of a by-product coke plant of 300 ovens. It will have a carbonizing capacity of approximately 2,000,000 tons per year and will replace beehive coking capacity to that amount. The plant will be equipped for the recovery of ammonia in the form of ammonium sulphate, of tar and of benzol and toluol as pure products. The ammonium sulphate and pure toluol will be sold to the Government for war purposes. The steel company proposes to use the gas in its steel plant operations.

The contract recently taken by the H. Koppers Co. to build two more batteries of by-product ovens for the Carnegie Steel Co. at Clairton, Pa., will give the Steel Corporation 768 ovens there, making it the largest by-product coke plant in the world.

Announcement has been made of the incorporation of the Fairmont By-Products Corporation of Fairmont, W. Va., which will build and operate a by-product coke plant. A contract has been given to the H. Koppers Co. for the construction of 110 ovens with the necessary boiler plant and accessories. The plant will produce ammonium sulphate and pure toluol for Government purposes and tar and benzol for general industrial use. It will also deliver a large amount of coke oven gas to relieve the shortage of natural gas in the Fairmont district. A site has been selected near Fairmont and a number of houses will be built for employees of the plant.

The 110 ovens to be built by the Fairmont By-Products Corporation are part of a Government program for the building of a considerable number of by-product ovens with a view to securing certain of the by-products for use in the manufacture of high explosive shells. Also connected with the Government program is the contract recently placed by the LaCledé Gas Light Co., St. Louis, for 44 Koppers by-product ovens, giving the LaCledé company a total of 100 ovens.

The four batteries of 52 ovens each, being built by the H. Koppers Company for the National Tube Co. at Lorain, Ohio, are expected to begin the manufacture of coke with by-product recovery about July 15.

Tennessee Company Changes

Shifts involving promotion of tried and experienced officials of the Tennessee Coal, Iron & Railroad Co. and its auxiliaries, the Chickasaw Shipbuilding Co. and the Fairfield Steel Co., have been announced by President George Gordon Crawford. Following are the changes:

W. G. Mathias, general superintendent Ensley works, Tennessee company, has been appointed assistant to vice-president, with offices in Brown-Marx Building.

Karl Landgrebe, assistant general superintendent Ensley works, has been appointed general superintendent Ensley works, succeeding Mr. Mathias.

A. W. Allen, superintendent open hearth furnaces, Ensley works, has been appointed assistant general superintendent, Ensley works, succeeding Mr. Landgrebe.

C. J. Barr, general superintendent Fairfield works, Fairfield Steel Co., has been appointed assistant to vice president with offices in the Brown-Marx Building.

G. A. Miller, superintendent of mills, Fairfield works, has been appointed general superintendent Fairfield works, succeeding Mr. Barr.

C. J. Barr has been appointed assistant to the vice president, Chickasaw Shipbuilding Co., with offices in the Brown-Marx Building.

The Ordnance Department of the Army has negotiated approximately 12,000 contracts since this country entered the war, according to an official announcement. These contracts involve within \$175,000,000 of the total funds directly available for the department for the present fiscal year—\$3,383,286,045. Additional contracts totalling \$1,503,703,741 have been entered into on the authority of Congress pending appropriation of an amount aggregating \$1,671,466,750.

Iron and Steel Markets

THE INCREASING DEMANDS

New Large Scale Government Operations

Higher Costs Through Freight Advances—Too Much Plant Closing Likely

Another week may pass before the committee of the War Industries Board and the steel companies completes the data which will decide how long the industry must confine itself to war and directly contributory work. Meanwhile, there is a summary rejection of reports of Government preparations to lay hold of the machinery of steel production.

Further plans are on foot for new Government operations on a large scale. Two new shipyards are one item, and more may soon be heard of additional gun plants. Four large Eastern shipyards will be greatly extended at once, and the Government will provide larger facilities for fabricating plates and shapes for ships.

Preference over everything else is now being given to plates for ships, shell steel coming second, and rails third in the list for special expedition. Government plate orders already on the books of the mills will take the full output for the next three months. It is evidently the intention of the Emergency Fleet Corporation to create a reservoir of plates against future increase in the shipbuilding program.

There is ahead of the structural shops fully 300,000 tons of work on which bids will be taken in the next four months, all of it directly or indirectly for the Government.

The advances in freight rates just announced at Washington will bear heavily on pig-iron and steel costs. With close to five tons of raw materials and supplies represented in a ton of steel, the new freight schedule means \$2 to \$3 additional per ton of finished material. While this increment does not argue for a reduction in prices when the Government action is again taken next month, the fact that the Government now absorbs so large a proportion of the output obviously works against its putting up prices on itself. Excess profits, subject to heavy taxation, have a very different look when derived from sales made to the general consuming trade.

The beginnings of adjustments by less essential industries are in evidence. Some contracting interests, for example, are preparing to disband their organizations for the period of the war. In some light castings and novelty lines the chance that raw materials may be available is vanishing. A number of lesser automobile companies are seeking Government work, but not all are finding it.

It is realized that before many months not a few manufacturers may be facing a suspension of operations, and steel makers do not ignore the possibility that later, when steel becomes available for such outlets, their old trade may not be in position to start in buying where it left off.

Awards have been made to six companies of 392,000 axles, or more than 125,000 tons, but most of the plates and shapes are still held up, and no decision has been made on the proposal to use Bessemer plates in part in the railroad cars.

An even larger demand for low-phosphorus pig iron than had been counted on has developed this week, and present production continues inadequate. Importation of Spanish ore is being urged as a means of relief.

Some of the price changes in the revision announced last week by the steel committee have raised objections from manufacturers, rivets and strip steel being included in the list.

The survey of the pig-iron trade is still quite incomplete. The reports show that merchant iron devoted to Government or essential work runs from 65 to 90 per cent of the total. What is certain is that considerable iron now going to foundries not on the essential list will be diverted.

Some 20,000 tons of shipbuilding material for Japan, in storage on the Pacific Coast, has now been shipped, but licenses have not yet been issued, though expected daily, on the remaining 155,000 tons of the revised tonnage to go in compensation for Japan-built ships. All told, 100,000 tons will move at the terms of contracts written last year, and 75,000 tons at the Government prices.

Some of the pipe foundries are working in a hand-to-mouth way, having no assurance of a pig-iron supply since the tonnage they contribute to strictly Government uses is relatively small.

Pittsburgh

PITTSBURGH, May 28—(By Wire).

The revision in prices on many iron and steel products sent out on May 21 by the Committee on Steel and Steel Products of the American Iron and Steel Institute, as printed in full in THE IRON AGE of May 23, was the principal development in the steel trade last week, while the heavy advance in freight rates on iron ore, coal and coke, pig iron and finished steel products announced on Monday, May 27, to be effective on June 1, has also come in for a good deal of discussion. This advance in freight rates means materially higher costs of making pig iron and steel products, but local interests have not yet had time to figure out even approximately just how much this increase in costs will amount to. Some of the prices announced on finished steel products, particularly the prices on rivets, are seriously objected to by the makers, who claim they cannot operate at the new prices and come out whole. While the base price of hot-rolled strip steel was reduced from \$4.50 to \$3.50 per 100 lb., still it is said the new list of extras and differentials will increase the cost of hot-rolled strip steel to the cold-rolled strip mills about \$8 per ton, and there is considerable objection to this. A meeting of the makers of cold-rolled strip steel to consider this matter was held in New York on Monday, May 27, and it is probable a committee will go to Washington in an endeavor to get a reduction in hot-rolled strip steel, or an advance in prices of cold-rolled strip steel.

General conditions in the local steel trade remain very quiet, and will likely continue so as long as the pledge given by the manufacturers to give 100 per cent of their output to the Government is in effect.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	May 28 1918	May 21 1918	Apr. 30 1918	May 29 1917
No. 2 X, Philadelphia....	\$34.25	\$34.25	\$34.25	\$45.50
No. 2, Valley furnace.....	33.00	33.00	33.00	43.00
No. 2 Southern, Cincinnati.	35.90	35.90	35.90	42.90
No. 2, Birmingham, Ala....	33.00	33.00	33.00	40.00
No. 2, furnace, Chicago*...	33.00	33.00	33.00	46.00
Basic, deliv., eastern Pa....	32.75	32.75	32.75	42.50
Basic, Valley furnace.....	32.00	32.00	32.00	42.00
Bessemer, Pittsburgh.....	36.15	36.15	36.15	45.95
Malleable, Chicago*.....	33.50	33.50	33.50	46.00
Malleable, Valley.....	33.50	33.50	33.50	43.00
Gray forge, Pittsburgh....	32.75	32.75	32.75	40.95
L. S. charcoal, Chicago....	37.50	37.50	37.50	50.25

Rails, Billets, etc., Per Gross Ton:	May 28 1918	May 21 1918	Apr. 30 1918	May 29 1917
Bess. rails, heavy, at mill.	55.00	55.00	55.00	38.00
O.-h. rails, heavy, at mill.	57.00	57.00	57.00	40.00
Bess. billets, Pittsburgh...	47.50	47.50	47.50	95.00
O.-h. billets, Pittsburgh...	47.50	47.50	47.50	95.00
O.-h. sheet bars, P'gh.....	51.00	51.00	51.00	95.00
Forging billets, base, P'gh.	60.00	60.00	60.00	110.00
O.-h. billets, Philadelphia..	50.50	50.50	50.50	95.00

Finished Iron and Steel.

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	3.685	3.685	3.685	4.159
Iron bars, Pittsburgh.....	3.50	3.50	3.50	4.00
Iron bars, Chicago.....	3.50	3.50	3.50	3.50
Steel bars, Pittsburgh.....	2.90	2.90	2.90	4.00
Steel bars, New York.....	3.095	3.095	3.095	4.169
Tank plates, Pittsburgh...	3.25	3.25	3.25	7.00
Tank plates, New York....	3.445	3.445	3.445	7.169
Beams, etc., Pittsburgh...	3.00	3.00	3.00	4.00
Beams, etc., New York....	3.195	3.195	3.195	4.419
Skelp, grooved steel, P'gh..	2.90	2.90	2.90	3.50
Skelp, sheared steel, P'gh..	3.25	3.25	3.25	5.50
Steel hoops, Pittsburgh..	3.50	3.50	3.50	4.25

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,	May 28 1918	May 21 1918	Apr. 30 1918	May 29 1917
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	5.00	5.00	5.00	7.50
Sheets, galv., No. 28, P'gh.	6.25	6.25	6.25	9.00
Wire nails, Pittsburgh....	3.50	3.50	3.50	3.50
Cut nails, Pittsburgh.....	4.00	4.00	4.00	4.00
Fence wire, base, P'gh....	3.25	3.25	3.25	3.45
Barb wire, galv., P'gh....	4.35	4.35	4.35	4.35

Old Material. Per Gross Ton:

Carwheels, Chicago.....	\$29.00	\$29.00	\$29.00	\$33.00
Carwheels, Philadelphia...	29.00	29.00	29.00	30.00
Heavy steel scrap, P'gh....	28.50	28.50	28.50	30.00
Heavy steel scrap, Phila....	29.00	29.00	29.00	26.00
Heavy steel scrap, Ch'gg....	29.00	29.00	28.50	32.00
No. 1 cast, Pittsburgh...	28.50	28.50	28.50	26.00
No. 1 cast, Philadelphia...	29.00	29.00	29.00	30.00
No. 1 cast, Ch'go, net ton.	26.50	26.00	27.00	26.00
No. 1 RR. wrot., Phila....	34.00	34.00	34.00	42.00
No. 1 RR. wrot., Ch'go, net.	29.75	29.75	29.75	36.00

Coke, Connellsville. Per Net Ton at Oven:

Furnace coke, prompt....	\$6.00	\$6.00	\$6.00	\$8.50
Furnace coke, future.....	6.00	6.00	6.00	8.00
Foundry coke, prompt....	7.00	7.00	7.00	9.50
Foundry coke, future.....	7.00	7.00	7.00	9.00

Metals:

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York....	23.50	23.50	23.50	32.50
Electrolytic copper, N. Y.	23.50	23.50	23.50	32.50
Spelter, St. Louis.....	7.25	7.25	6.75	9.37 $\frac{1}{2}$
Spelter, New York.....	7.50	7.50	7.00	9.62 $\frac{1}{2}$
Lead, St. Louis.....	6.85	6.85	6.62 $\frac{1}{2}$	11.22 $\frac{1}{2}$
Lead, New York.....	7.05	7.05	6.85	11.37 $\frac{1}{2}$
Tin, New York.....	\$1.00	\$1.03	95.00	65.00
Antimony (Asiatic), N. Y.	12.25	12.50	13.00	24.00
Tin plate, 100-lb. box, P'gh.	\$7.75	\$7.75	\$7.75	\$8.50

Production is being speeded up in every possible way, and the manufacturers are putting forth every effort they can to give the Government a full output of steel, and as quickly as it is wanted. The new freight rates are going to increase costs very considerably, and with the constantly higher prices being paid for many classes of labor some of the smaller steel companies are commencing to wonder whether they will be able to live or whether they may have to close their plants. It is claimed that on some lines of products, operating costs this year have gone up 25 per cent or more. The tin plate makers claim that with the increases in freight rates, and the enormously high prices ruling for pig tin, they should be allowed an advance in prices of tin plate for second half delivery.

The general opinion here is that all prices now in effect for iron and steel products are very likely to be reaffirmed by the War Industries Board for third quarter delivery. It is pointed out that with the Government taking practically 100 per cent of the steel output in its various forms, it is not likely to put the market up on itself.

Pig Iron.—Friday, May 31, was the day originally set for all the questionnaires on the pig iron situation to be in the hands of the Sub-Committee on Pig Iron, Iron Ore and Lake Transportation and also in the hands of J. L. Replogle, director of steel supply, but some returns are not yet in, and it will probably be some time after May 31 before all have been received. Consumers of pig iron are being reminded that the request of the committee for a complete survey of the pig iron situation is really a Government demand, and it is to the interest of all pig iron consumers to fill out the questionnaire and return it promptly. If any parts of it are not clear to consumers the committee will be very glad to answer promptly any questions consumers may put to it. In the meantime the pig iron market is at a standstill as far as new sales go. There is an insistent demand for pig iron from nearly all consumers, but with none to be had. One inquiry came

out to-day for 10,000 tons of foundry iron for delivery over last half of this year, but it is very doubtful whether even a part of this quantity can be secured. The pig iron survey that is being made is going to disclose exact conditions existing in the pig iron market, and when it is completed it is very probable that some consumers of iron, not making products classed as strictly war essentials, may find their supply cut off, or else very much reduced. In the revision of prices on steel products sent out last week by the American Iron and Steel Institute, no changes were made in prices on Bessemer, basic or foundry iron, but in the case of Bessemer iron the base price of \$35.20 at valley furnace now prevails on iron running up to 3 per cent in silicon, instead of 2½ per cent as before. On silicons running 3 to 3½ per cent \$2 per gross ton extra is added, 3½ to 4 per cent, \$3 per gross ton, 4 to 4½ per cent, \$4 per gross ton and 4½ to 5 per cent, \$5 per gross ton. The schedule of prices on high silicon or silvery iron decided upon by the committee are given in this report in the table printed under the heading of ferroalloys. A material advance in freight rates on pig iron is to go into effect on June 1, and also on iron ore, coal and coke. Furnaces are now busy figuring out what these advances in freights will mean in higher costs of making iron.

Basic pig iron, \$32; Bessemer, \$35.20; gray forge, \$32; No. 2 foundry, \$33; No. 3 foundry, \$32.50, and malleable, \$33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—No sales are being made in billets or sheet bars, simply for the reason that the steel is not to be had. Producers of steel would be very glad to buy freely in the open market, if they could, in order to help out their own needs and those of their customers. It is also said that discard steel is now about as scarce as new steel, and is very difficult to find. The supply of sheet bars is particularly short, and nearly all the sheet and tin mills are suffering more or less in output for lack of sufficient steel. In its revision of

prices sent out by the Committee on Steel and Steel Products on May 21, forging ingots under 20 in. diameter take \$5 advance over the base price, which is \$73, f.o.b. Pittsburgh. Government prices for second quarter are as follows:

We quote 4 x 4 in. soft Bessemer and open-hearth billets at \$47.50, sheet bars \$51, forging ingots \$73, and forging billets \$60 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Ferroalloys.—Consumers of ferromanganese are quickly adapting themselves to the new practice of using 70 per cent ferromanganese and 16 per cent spiegeleisen as recommended recently by the subcommittee on ferroalloys of the American Iron and Steel Institute. The whole market on ferroalloys is very strong, and the demand is active. The cutting down of imports from England has strengthened prices on domestic ferroalloys very considerably. A local steel interest closed last week for 1000 tons of 70 per cent ferromanganese at \$250 per gross ton delivered, and also for 3000 to 4000 tons of 16 per cent spiegeleisen at about \$73 delivered, both for last half of the year. A Youngstown interest also bought 500 tons of 70 per cent ferromanganese for last half of the year, and a local interest the same quantity for same delivery at \$250 delivered. An inquiry is in the market for 500 to 750 tons of 18 to 20 per cent spiegeleisen, on which some makers refuse to quote, and others have named \$80 to \$85 at furnace. The demand for 50 per cent ferrosilicon is only fair, but prices are firm. We quote 70 per cent ferromanganese at \$2.50 delivered, 16 per cent spiegeleisen at \$65 to \$70 at furnace, 50 per cent ferrosilicon for prompt shipment at about \$165, and for delivery over last half of the year \$155 at furnace, the furnace usually absorbing the freight. One consumer states he has been offered 50 per cent ferrosilicon for delivery over last half of the year at \$150 at furnace.

We now quote 9 per cent Bessemer ferrosilicon at \$54; 10 per cent, \$55; 11 per cent, \$58.30; 12 per cent, \$61.60. We quote 6 per cent silvery iron, \$41; 7 per cent, \$43; 8 per cent, \$45.50; 9 per cent, \$47.50; 10 per cent, \$50. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of \$2 per gross ton, for delivery in the Pittsburgh district.

Steel Rails.—As yet nothing has come out from the Government in regard to its expected purchases of steel rails. Very little is being done in standard sections, but the demand for light rails is active. The Government price on 25 to 45-lb. sections is \$3 per 100 lb. f.o.b. Pittsburgh. Prices on standard sections are open, and on Bessemer rails range from \$61 to \$63, and on open-hearth \$63 to \$65 at mill.

Structural Material.—An inquiry has come in the market from Westinghouse Church Kerr & Co. for 2500 tons of structural steel for the new machine shop to be built at Glenwood, this city, by the Baltimore & Ohio Railroad. The award is expected to be made in a short time. The Pennsylvania Railroad is also in the market for 800 tons of bridge work. These are the first inquiries of any note for structural work that have come out in this district for some time. We quote beams and channels up to 15 in. at 3c. at mill, Pittsburgh.

Plates.—It is becoming more and more evident that the entire output of plates by the mills this year will likely be needed by the Government to carry out its shipbuilding programs. Reports are that the Bethlehem Steel Co. is to build an immense shipyard on the Pacific Coast, probably at San Francisco near its Union Iron Works in that city, the other to be located in the East. Reports are that Government orders already on the books of the mills for plates will take the entire output over the next three months and these are only a small part of Government needs. Concerns using plates, and not making products classed as war essentials, are going to have their own troubles in a short time finding plates. We quote ¼ in. and heavier sheared plates at 3.25c. at mill, Pittsburgh.

Iron and Steel Bars.—The mills are not disposed to sell soft steel bars to commercial users, except with Government sanction. Mills rolling iron bars expect to furnish a good part of the bars needed for the Govern-

ment cars allotted recently. With orders already on their books and in sight, iron and steel bar mills are filled up over the next three or four months. We quote steel bars rolled from billets 2.90c.; from old steel rails, 3c., and refined iron bars, 3.50c. at mill, Pittsburgh.

Cold-Rolled Strip Steel.—No change was made in prices of cold-rolled strip steel as given out by the Committee of Steel and Steel Products of the American Iron and Steel Institute, May 21, with the exception that all prices for cold-rolled strip steel are now f.o.b. maker's works, with actual freight allowed to destination when not in excess of 31c. per 100 lb. The Government is still taking a very large part of the output of cold-rolled strip steel, while the commercial demand is only fairly heavy. None of the mills making cold-rolled strip steel is running to more than 75 per cent capacity and some at a less rate, due to shortage in steel and labor. The trade should note carefully the regulation in regard to freight.

We quote cold-rolled strip steel at \$6.50 per 100 lb., f.o.b. Pittsburgh, terms 30 days, less 2 per cent cash in 10 days, when sold in quantities of 300 lb. or more.

Shafting.—The Government is still taking 85 to 90 per cent of the entire output of shafting either on direct or indirect orders. Makers state that the demand from auto builders and the screw stock machine trade is quiet, but the demand from implement makers, builders of tractors, and other products classed as war essentials is quite heavy. Government discounts are reported as being very firmly held, and are 17 per cent off in carloads, and 12 per cent in less than carloads, f.o.b. Pittsburgh.

Nuts and Bolts.—An inquiry is expected from the Ordnance Department in a few days for 30,000,000 to 40,000,000 bolts. Regarding the Government contract some time ago for 129,000,000 bolts, about 25 per cent of this has already been practically filled by the makers, and the remainder has been allocated, but the direct orders have not yet been placed. Makers report the commercial demand very heavy, but are strictly observing their pledge to give 100 per cent of output to the Government, if needed, all other business being subordinate. No changes in prices on nuts and bolts were made by the committee on steel and steel products in its announcement of prices sent out on May 21. Government discounts in effect for this quarter are given on page 1443.

Sheets.—The shortage in supply of sheet bars is getting more acute, and at present independent sheet mills are not operating to more than 80 per cent of capacity, and possibly slightly less, while the American Sheet & Tin Plate Co., is running at between 60 and 65 per cent. At these rates of operation, the mills have orders on their books for the Government that will take fully two months' output to supply, and a longer period if real hot weather should decrease output. The mills are taking orders from jobbers for sheets, subordinate to Government business, and will give no promise as to when jobbers' orders will be filled. The Government placed last week probably 10,000 tons of sheets, which is the lightest week's purchases in some time. However, very large Government orders for blue annealed, black and galvanized sheets are in sight and will no doubt come to the mills in the near future. Stocks are very light and it is said some jobbers in certain sections are not strictly observing the maximum jobbing prices on sheets fixed by the Government some time ago. Prices on sheets, fixed by the Government for this quarter are given on page 1443.

Tin Plate.—Our statement in this report last week to the effect that the War Industries Board had made a ruling that the mills shall take orders until further notice only for tin plate for food containers has caused a good deal of comment in the trade. This ruling which came from the Conservation Division of the War Industries Board reads: "Tin mills shall cease scheduling orders for other than food containers and the requirements of our Government and its Allies at least until more definite instructions are issued." A letter has been sent to manufacturers to this effect by the Committee on Steel and Steel Products, of the American Iron and Steel Institute, and the ruling is interpreted

by local mills to mean they shall cease taking orders for tin plate except for food containers for our Government and its Allies. This has really been in effect voluntarily by the mills for some time, but the official ruling on the matter has been issued from Washington. Tin plate mills are operating, on the whole, close to 95 per cent of capacity, and output is running, it is said, close to 800,000 boxes per week. While some manufacturers believe there should be an advance for second half of the year in price of tin plate, others are not of that opinion. Pig tin has sold to several large consumers as high as 96c. per lb. We quote tin plate at \$7.75 per base box up to June 30, rolled from Bessemer or open-hearth steel, f.o.b. Pittsburgh. The demand for terne plate is very light.

Cotton Ties.—While no sales of cotton ties have been made by the mills for delivery starting July and later, they have advised their trade that their needs will be taken care of, prices to be those fixed by the Government for shipment starting July. In spite of the shortage in steel, the output of cotton ties this year is likely to be slightly larger than last year. The Pittsburgh Steel Co. will make fully as many ties as it did last year in spite of the large orders for nails and wire this concern is filling for the Government.

We quote cotton ties at \$1.90 per bundle of 45 lb. for lots of 3000 bundles and over. For lots of 1000 bundles and up to, but not including, 3000 bundles, \$1.92 per bundle, f.o.b. Pittsburgh. These prices are for April shipment, while for May 1c. additional carrying charge is made, and 2c. for June.

Wire Rods.—The new demand is reported active, but there has been great scarcity in supply of rods for some months, as local mills have not regarded \$75 as an attractive price for soft rods, and have not been making full output for some time, using steel for other war essentials. Makers state they could sell rods very freely if they had them to spare. There is a fairly active export inquiry, but local mills are not quoting. Prices on rods in effect until June 30, are given on page 1443.

Wire Products.—As yet the order for 50,000 tons of barb wire wanted by the British Government has not been allocated to the mills, although the mills advised Washington some time ago how much of the contract each could furnish, and take care of other Government orders. The wire nail for the wooden cars to be built for the Government amounting to 16,000 to 18,000 kegs will be bought by the car builders themselves, but inquiries for them have not been sent out. The commercial demand for nails and wire is extremely heavy, and mills are turning down every day orders from regular customers which they would be glad to fill, if they could, and at the same time take care of Government wants. Stocks of nails and wire everywhere are very low, and mills are shipping these products to the commercial trade only when they can do so and still fulfill their obligations to the Government for 100 per cent of output, if needed. The government price on cut nails is \$4 per keg f.o.b. Pittsburgh. Prices on nails and wire for this quarter are given on page 1443.

Hot-Rolled Strip Steel.—The Government is a very heavy buyer of this product, and is said to be taking 75 to 85 per cent of the entire output on direct and indirect orders. The Government price for hot-rolled strip steel for this quarter is \$3.50 per 100 lb. f.o.b. Pittsburgh, subject to the list of extras and differentials as given on pages 1357 and 1374 of THE IRON AGE of May 23.

Rivets.—The Committee on Steel and Steel Products of the American Iron and Steel Institute, in its revision of prices sent out on May 21, fixed the price of cone-head structural rivets at \$4.40, cone-head boiler rivets at \$4.50, and small rivets at 50 and 10 per cent off list. Makers report that the Government is taking 75 per cent or more of the limited output of rivets, and that the commercial demand is quite heavy.

Skelp.—Mills rolling skelp report that they are sold up for four or five months, and could readily sell double the quantity of orders on their books if they had the material to spare, and could make the delivery.

We quote grooved skelp at \$2.90; universal skelp, \$3.15, and sheared skelp, \$3.25 base. Special skelp for boiler tubes, etc., is \$3.40 for base sizes and \$3.55 for other sizes, all prices being per 100 lb., f.o.b. Pittsburgh.

Hoops and Bands.—The Committee on Steel and Steel Products has made one classification in prices on hoops and bands and hot-rolled strip steel. The price of steel hoops for cooperage purposes remains at \$3.50 per 100 lb., f.o.b. Pittsburgh, while bands have also been put at 3.50c. per lb., but the extras and differentials have been materially changed, and those now in effect are given on pages 1357 and 1374 of THE IRON AGE of May 23. Formerly bands took the steel bar price, and steel bar extras, but this has all been changed. The Government is still taking very close to 100 per cent of the output of both hoops and bands. The demand for steel hoops for cooperage purposes is reported by the mills as exceptionally heavy.

Wrought Pipe.—No changes in discounts on iron and steel pipe were made by the Committee on Steel and Steel Products in its price announcements sent out on May 21. The Government is reported to be taking 75 per cent or more of the present output of iron and steel pipe on direct and indirect orders, using very large quantities of 6, 8 and 10-in. pipe in various projects for transporting oil that it has under way in different parts of the country. The demand for butt-weld pipe is light, largely due to the falling off in new building operations. The commercial demand for pipe is heavy and jobbers report their stocks as being very low.

Boiler Tubes.—The new prices on lap-welded super-heater tubes, and also on seamless steel tubing as given out last week by the Committee on Steel and Steel Products were given on page 1375 of THE IRON AGE of May 23. No changes in base prices were made on iron or steel tubes. Mills rolling iron and steel tubes are filled up for months, and are very much back in deliveries, both on commercial and Government orders. Discounts for iron and steel tubes in effect for this quarter are given on page 1443.

Coke.—The car supply for two weeks or more has been large enough to take the entire output of coke, which is running about 75 per cent of the capacity of the two regions. Were the output of coke 100 per cent of capacity there would hardly be enough cars to handle it. There is no further complaint from blast furnaces about delivery of coke, as they are all receiving it as fast as needed, but stocks of coke at most of the furnaces as yet are rather light. Some blast furnace interests still have coke coming to them on contracts made before the Government fixed prices, and on some of these contracts furnaces are paying \$8.50, and in a few cases as high as \$9 per net ton at oven. A few of these contracts expire June 30, and some run over the remainder of this year. Very little free coke is being made, but as soon as any is available it is very quickly sold to consumers. No contracts are being made, nor is it likely any will be, so long as the Government continues to fix prices. The Connellsville Courier gives the output of coke in the Upper and Lower Connellsville regions for the week ending May 18 as 343,270 tons, an increase over the previous week of 2160 tons. Government prices in effect for this quarter are \$6 for 48-hr. furnace coke, \$7 for 72-hr. foundry, and \$7.35 for crushed coke, from 1-in. size, all in net tons at oven.

Old Material.—Conditions in the local scrap market have not changed materially since the decision was made by the War Industries Board to allow a commission of 3½ per cent on sales of scrap made by dealers to consumers. There are reports here that sales of scrap are being made to consumers at higher than the maximum prices fixed by the Government, but confirmation of these reports can not be secured, as the details of them are carefully concealed both by the buyer and the seller. Some of the larger scrap dealers say emphatically that under no condition would they agree to sell scrap at higher than the Government maximum prices. There is a very active demand from nearly all consumers in this district for scrap, and dealers say they could do a great deal of business if they could find the material, but it can not be had. Later on, when the new cars and locomotives ordered by the Government are in service it is probable a good many old cars and locomotives now doing duty will be

scrapped as they should have been long ago, and this will add materially to the visible supply of scrap. A feature of the market is that the supply of scrap is being localized, i.e., scrap originating in Cleveland, Chicago, Buffalo and other important scrap centers is sold where it originates, as the freight rates prohibit it from being shipped to other scrap consuming centers. The Baltimore & Ohio scrap list came out last week, and is quite heavy. It is said that no scrap is being sold at less than Government maximum prices. Recently there was an abundant supply of turnings, and the two leading local consumers refuse to allow dealers a commission, but the surplus supply of turnings has been used, and all consumers are reported now as willing to pay the commission. No large sales of scrap have been made in this market for some little time by dealers to consumers, largely for the reason that the scrap is not to be had. The Pennsylvania Railroad scrap lists were sent out from Philadelphia under date of May 27, and are fairly heavy. Bids are to be in at Philadelphia not later than June 4, and awards are to be made on June 7. Prices on iron and steel scrap, effective from April 1, nearly all of which have been fixed by the Government, in effect for this quarter, for delivery in Pittsburgh and other points that take Pittsburgh freights, are as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	\$28.50 to \$29.00
No. 1 cast scrap (for steel plants)	28.50 to 29.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., Franklin, Pa., and Pittsburgh	33.00 to 34.00
Hydraulic compressed steel scrap	26.00 to 27.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mills, Pittsburgh district	24.00 to 25.00
Bundled sheet stamping scrap	22.00 to 23.00
No. 1 railroad malleable scrap	28.00 to 29.00
Railroad grate bars	18.00 to 19.00
Low phosphorus melting stock (un-guaranteed)	34.00
Low phosphorus melting stock (guaranteed)	36.50
Low phosphorus melting stock (bloom and billets ends, heavy plates)	39.00
Iron car axles	46.00 to 46.50
Locomotive axles, steel	46.00 to 46.50
Steel car axles	46.00 to 46.50
No. 1 busheling scrap	26.00 to 27.00
Machine shop turnings	18.00 to 19.00
Cast iron wheels	28.00 to 29.00
Rolled steel wheels	34.00 to 36.00
Sheet bar crop ends (at origin)	34.00 to 35.00
Cast iron borings	18.50 to 19.00
No. 1 railroad wrought scrap	33.00 to 34.00
Heavy steel axle turnings	23.00 to 24.00
Heavy breakable cast scrap	28.00 to 29.00

British Steel Market

Ferromanganese Higher for Export to North America—Pig Iron in Active Demand (By Cable)

LONDON, ENGLAND, May 29.

There is a large and continuous demand for hematite pig iron. American semi-finished steel is nominal. Tin plates are quoted at 32s, 10½d. basis, and 40,000 boxes of oil plates have been booked for the Eastern trade. Ferromanganese has sold for \$265 c.i.f. Canada, with \$260 quoted for the nearest Atlantic ports. We quote as follows:

Tin plate coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, 32s 10½d.	
Ferromanganese, \$260, c.i.f. for export to America; £26 10s for British consumption.	
Ferrosilicon, 50 per cent, c.i.f. £35 upward.	
On other products control prices per gross ton are:	
Hematite pig iron, East Coast, £6 2s 6d; West Coast, £6 7s 6d.	
Cleveland pig iron, £4 15s to £4 19s.	
Steel plates, ship, bridge and tank, £11 10s.	
Steel sheets, black plate, all open annealed, produced in sheet mills, £16 to £18.	
Bar iron, standard quality, £13 17s 6d; market, £16.	
Sheet and tin plate bars, £10 7s 6d.	
Blooms and billets for rerolling (ordinary), £10 7s 6d; special quality, £11.	

Chicago

CHICAGO, May 27. (By Wire.)

Orders for axles for Government freight cars have been placed as follows: Carnegie Steel Co., 110,000; Pollak Steel Co., 134,000; Illinois Steel Co., 84,000; Midvale Steel & Ordnance Co., 30,000; Laclede Steel Co., 16,000, and Pittsburgh Forge & Iron Co., 18,000, making a total of 392,000 smaller makers presumably having received the remaining 8000. Makers of rolled steel products have been given to understand they will have to furnish plates and other material, but definite orders are not yet in their hands. The great question is what should be temporarily displaced to give capacity for rolling the car material. Bar iron makers have received orders for some round tonnages from car builders and it is not improbable that some of the iron will enter cars in the form of arch-bar trucks. Insufficient coal holds the leading local interest from maximum production of steel. It has the ovens to make coke and has all else required, but of coal it does not get enough, meanwhile the plate mills are worked to capacity. Whatever suffers, they must not, for the great crying need is plates.

The action of the War Industries Board in supervising the shipping of sheet bars, recently taken, is helping out the mills which are supplying sheets for war needs and it is probable that a war contractor properly armed with a priority certificate would have little difficulty in placing his sheets. As a matter of fact, priority regulations govern all deliveries of steel whether from mill or jobber. How tight the market is may be gathered from the fact that a large Eastern mill with a great diversity of products to offer ordinarily is now limiting its sales practically to benzol, tool steel and iron tubes where the ordinary buyer is concerned. No structural fabricating jobs are reported in this market. The pig iron market is *in statu quo*. The work of collecting data which will show just where the iron industry stands is nearing an end.

Pig Iron.—In the iron market there are few developments to record. These firms on which was imposed the duty of collecting data bearing on production, stocks and consumption are finishing that work. A considerable number of the reports from consumers bear out the fact obtained by previous investigation that many consumers have stocks sufficient to carry them two to three months and in a few cases longer. Apprehension over the supply caused them to stock more pig iron than was customary with them. Some authorities in the trade are of the opinion that, provided iron is properly distributed, there will be sufficient for all purposes and enough to keep the foundries running full. Some resale malleable was taken by a local company recently. Producers' representatives are not getting much inquiry, but nearly all would experience no delay in placing iron provided they could get it to place. In a general way, shipments are good.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5	\$37.50
Lake Superior charcoal, No. 6 and Scotch	39.00 to 40.50
Lake Superior charcoal, No. 6 and Scotch	40.00
Northern coke foundry, No. 1	33.50
Northern coke foundry, No. 2	33.00
Northern coke foundry, No. 3	32.50
Northern high-phosphorus foundry	33.00
Southern coke No. 1 foundry and No. 1 soft ..	38.50
Southern coke No. 2 foundry	37.00
Malleable	33.50
Basic	32.00
Low phosphorus (copper free)	53.00
Silvery, 7 per cent.	45.54

Ferroalloys.—Inquiry for standard ferromanganese is light. Some 80 per cent material is available, although some makers will not manufacture it unless the consumer has Government consent to use it. The quotation for standard is \$250 delivered with \$4 additional for each additional unit of manganese.

Plates.—It hardly need be said that plate mills are running to their fullest capacity. Their maximum

production is maintained regardless of any lagging in other directions. The railroad freight car tonnage continues to hang fire, although the mills have been apprised that they must supply the material. The main question, after the formal orders are received, is as what other commitments can be sidetracked. The mills have been helped a little by the action of the Submarine Boat Corporation in asking that certain orders be held up, until prior ones were completed. This having enabled the mills to concentrate on material for some branches of the Emergency Fleet Corporation which were clamoring for material. The official mill quotation is 3.25c., Chicago or Pittsburgh, with jobbers quoting 4.45c. where they can and will sell.

Structural Shapes.—No lettings of fabricated work have been announced this week and it is not expected there will be much business of this character from now on, except for essential railroad repairs and like work. The mill quotation is 3c., Chicago or Pittsburgh, material out of warehouse being quoted at 4.25c.

Bars.—Bar iron is more active, especially in view of some round tonnages having been placed by the car builders. Though it is not known certainly here, it is probable that some of this iron may be for arch-bar trucks to be used in Government freight cars, it having been suggested that steel could be conserved in this way. It is predicted that the demand for iron will broaden as steel stocks become low. Mild steel bars are unobtainable unless by priority order. The production of rail carbon bars continues to be restricted by the inadequate quality of rerolling rails which are coming on the market and under these conditions there is an excess of business. We quote mill prices as follows: Iron bars, 3.50c., Chicago; rail carbon, 3c., Chicago, and steel bars, 2.90c., Chicago or Pittsburgh.

Jobbers' prices: Soft steel bars, 4.10c.; bar iron, 4.10c.; reinforcing bars, 4.10c., base, with 5c. extra for twisting sizes $\frac{1}{2}$ in. and over and usual card extras for smaller sizes; shafting, list plus 10 per cent.

Mill prices are: Iron bars, 3.50c., Chicago; rail carbon, 3c., Chicago, and bar iron, 2.90c., Chicago or Pittsburgh.

Sheets.—None of the mills will sell except by priority order, and some are not anxious to take on more business at all. Domestic buyers can not get this class of material any more than they can some other kinds. A common procedure is for a consumer to ask a producer for material provided a priority order issues. If the mill gives assent, the matter is then taken up with the Priority Board, and if this body deems the need essential, the consumer gets his material as soon as the mill can supply it. Some of the manufacturers of sheets who make essentials obtained business through the action of the War Industries Board in directing that no sheet bars be delivered without its approval, action which worked for a better distribution of the bars. One firm has sent letters to its customers stating they can have sheets if they are doing Government work. We quote No. 28 black at 25c., No. 28 galvanized at 6.25c. and No. 10 blue annealed at 4.25c., all Pittsburgh.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 5.45c.; No. 28 black, 6.45c., and No. 28 galvanized, 7.70c.

Wire Products.—General business is good with the jobbers especially active. Some have been holding off in buying but recent developments in the shortage of steel has frightened them and now they want to buy. Usually their orders are taken, but there is no such thing as prompt delivery. The mills are practically out of the market on barbed wire. We quote:

Nails, \$3.50, Pittsburgh; plain fence wire, \$3.25; painted barb wire, \$3.65; galvanized barb wire, \$4.35; polished staples, \$3.65, and galvanized staples, \$4.35.

Cast-Iron Pipe.—The United States Cast Iron Pipe & Foundry Co. was the successful bidder for 1600 tons awarded May 22 by Ann Arbor, Mich. A few small propositions are pending, but nothing new has come out.

Quotations per net ton Chicago are as follows: Water pipe, 4-in., \$63.35; 6-in. and larger, \$60.35, with \$1 extra for Class A water pipe and gas pipe.

Bolts and Nuts.—The makers are working toward the point where they will not have more than a minimum amount of material wherewith to manufacture for domestic use. For prices and freight rates see

finished iron and steel f.o.b., Pittsburgh, page 1443. Jobbers' quote:

Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to $\frac{3}{8}$ x 4 in., 40 and 10 per cent off; larger sizes, 35 and 5 off; carriage bolts up to $\frac{3}{8}$ x 6 in., 40 and 2½ off; larger sizes, 30 and 5 off; hot pressed nuts, square tapped, \$1.05 off, and hexagon tapped, 85c. off per 100 lb.; coach or lag screws, gimlet points, square heads, 50 per cent off.

Rails and Track Supplies.—The market is dormant. We quote:

Standard railroad spikes, 4.11½c., Chicago. Track bolts, with square nuts, 5.11½c., Chicago. Tie plates, steel, 3.25c.; tie plates, iron, 3.75c.; f.o.b. maker's mill. The base for light rails is 3c., f.o.b. maker's mill for 25 to 45-lb. sections, lighter sections taking Government extras.

Old Material.—The market is firm, although there is no rush of business. Leading companies are willing to pay \$29 for melting steel and one is seeking shoveling steel at \$28.50. That the mills need scrap is recognized. It is reported that steel has been bought here for other districts, the buyer paying the freight differential. Although it is not understood that permits to transact business in this manner have yet been granted. Cast has been bought by steel mills at \$29 plus the commission of 3½ per cent, foundries paying a higher price. In turnings, there is no movement. The Belt Line Railway offers a few cars. The Soo Line issues a list including three miles of cast iron water pipe. The C. and A. has issued a rather large list and smaller ones come from the C. B. and Q. and the Santa Fe.

We quote for delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Old iron rails.....	\$38.00 to \$39.00
Relaying rails.....	60.00
Old carwheels.....	29.00
Old steel rails, rerolling.....	34.00
Old steel rails, less than 3 ft.....	34.00
Heavy melting steel.....	29.00
Frogs, switches and guards, cut apart.....	29.00
Shoveling steel.....	28.50 to 29.00
Steel axle turnings.....	21.50 to 22.50

Per Net Ton	
Iron angles and splice bars.....	\$34.82
Iron arch bars and transoms.....	39.50 to 40.50
Steel angle bars.....	29.00 to 30.00
Iron car axles.....	41.52
Steel car axles.....	41.52
No. 1 railroad wrought.....	29.75 to 30.36
No. 2 railroad wrought.....	27.50 to 28.00
Cut forge.....	27.50 to 28.00
Pipes and flues.....	23.00 to 23.50
No. 1 busheling.....	25.75 to 26.25
No. 2 busheling.....	17.25 to 17.75
Steel knuckles and couplers.....	30.36
Coil springs.....	30.36
No. 1 boilers, cut to sheets and rings.....	21.00 to 22.00
Boiler punchings.....	32.00 to 33.00
Locomotive tires, smooth.....	37.00 to 38.00
Machine-shop turnings.....	15.50 to 16.00
Cast borings.....	15.75 to 16.25
No. 1 cast scrap.....	26.50 to 27.00
Stove plate and light cast scrap.....	23.00 to 23.50
Grate bars.....	23.00 to 23.50
Brake shoes.....	23.00 to 23.50
Railroad malleable.....	29.50 to 30.00
Agricultural malleable.....	28.00 to 29.00
Country mixed scrap.....	19.50 to 20.00

Birmingham

BIRMINGHAM, ALA., May 27.

Pig Iron.—Almost no selling of pig iron is taking place. One firm was forced to turn down regular customers, asking for 500 to 1000 tons in several instances because the grade desired was not on yards and uncertainty as to its production exists. Makers are especially reluctant to accept orders specifying analyses. Back of it all is the shortage and inefficiency of labor. Stocks are going down rapidly. One large interest shipped 50,000 tons in April and as much in May. All stocks were reduced during April until it is doubtful whether there is as much as 70,000 tons of free foundry iron on yards. The basic on yards is pre-empted for the most part by its own makers for conversion into steel shapes. There has been little or no diversion of pig iron shipments, but some of this is expected when the Government survey of consuming plants is completed. However, as most large foundries and machine shops are on Government work, it looks more as if it will get down to a choice of Government work rather than Government and other work. Furnaces are not.

operating to maximum and there is no indication that they will in the present state of labor and its reflection in the output of raw material. Sheffield Iron Corporation, Sheffield, Ala., is receiving coal regularly for the Jasper ovens, which marks progress toward resumption of the furnaces at Sheffield. It is stated that the Central Alabama Coal & Iron Co. will rehabilitate the long-idle stack at Jenifer, Ala., and that the Thomas Furnace Co. will operate. Nothing further has been heard from Talladega, Ala., furnace since the Japanese interests seeking to operate received word of the exportation prohibition order. We quote per gross ton, f.o.b. Birmingham district furnaces as follows:

No. 2 foundry and soft.....	\$33.00
Basic	32.00

Cast-Iron Pipe.—Cast-iron pipe has been advanced by Government order from \$49 to \$55. The leading interest reports an order from Corsicana, Tex., of 3½ miles of 14-in. pipe, the American Cast Iron Pipe Co. sharing in the order. Otherwise cantonment and Government work constitute the 50 per cent output.

Coal and Coke.—Interest centered during the week on the Government announcement of a 10c. reduction in the price of bituminous coal and an agreement that the railroads will pay the standard price and abandon the preferential car practice. The favoring of mines producing railroad coal has been a disturbing factor in the coal field. Announcement that Washington will favor by-product coke plant construction is assurance that the Tennessee company will experience no delay in building its 154-oven addition at Fairfield, and lends encouragement to the Sloss-Sheffield Steel & Iron Co. in its earnestly considered plans to build a by-product plant. There are cars sufficient in the coal field, but production shows no increase over last year. Coke will continue scarce.

Old Material.—Consumers have yards well filled for the time being, and Government price regulation restricts any violent quotation shifts. There has been an increase in the employment of negro women in Southern scrap yards with resultant good effects. We quote per gross ton, f.o.b. Birmingham district yards, prices to consumers as follows:

Old steel axles.....	\$32.00 to \$33.00
Old steel rails.....	27.00 to 27.50
Heavy melting steel.....	25.50 to 26.00
No. 1 railroad wrought.....	31.00 to 32.00
No. 1 cast.....	27.00 to 27.50
Old carwheels.....	28.00 to 29.00
Tramcar wheels.....	21.00 to 25.00
Machine shop turnings.....	15.00 to 16.00
Cast iron borings.....	15.00 to 16.00
Stove plate	23.00 to 24.00

. St. Louis

ST. LOUIS, May 27.

Finished Iron and Steel.—The mills are taking no new business and shipping very little on previously accepted business, while the warehouses are holding sharply to all material in the classes required by the Government and are letting go of finished products only in most urgent cases, and then only when well protected against complaint from the authorities. On stock out of warehouse, we quote as follows: Soft steel bars, 4.17c.; iron bars, 4.17c.; structural material, 4.27c.; tank plates, 4.52c.; No. 8 sheets, 5.47c.; No. 10 blue annealed sheets, 5.52c.; No. 28 black sheets, cold rolled, one pass, 6.52c.; No. 28 galvanized sheets, black sheet gage, 7.77c.

Pig Iron.—Representatives of the furnaces are doing practically no business at all, even in odd lots which are not in line for Government use and are utilizing their time in looking after shipments already made and in explaining the situation to customers. The local furnace, like all others, is tied up and is making no offers and accepting no business that is offered to it. The general situation is one of waiting for the ironing out of the Government requirements and then doing whatever is possible with what is left.

Coke.—There is a better flow of shipments under previous contracts. By-product coke from local and

nearby plants is tied up under contracts for a long distance ahead and no new business is being looked for or accepted.

Old Material.—Prices remain practically without change. The quotations are strongly held, however, the belief being that there will be sharp need for material shortly. None is moving, partly because of the car shortage, and more on account of the shortage of labor for picking up and for reloading scrap, both in the immediate vicinity and in the outlying towns whence a considerable portion of the usual supply comes. Steel would be in active demand, if any were obtainable, but the mills are not particularly active in the market because of the well-known conditions existing. Cast iron is also scarce. The reports from all parts of the St. Louis district show the same state of affairs. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton

Old iron rails.....	\$36.50 to \$37.00
Old steel rails, rerolling.....	33.50 to 34.00
Old steel rails, less than 3 ft.....	31.00 to 31.50
Relaying rails, standard sections, subject to inspection.....	60.00 to 65.00
Old carwheels	28.50 to 29.00
No. 1 railroad heavy melting steel scrap	27.50 to 28.00
Heavy shoveling steel.....	26.50 to 27.00
Ordinary shoveling steel.....	26.00 to 26.50
Frogs, switches and guards cut apart.....	28.50 to 29.00
Ordinary bundled sheet scrap.....	22.50 to 23.00
Heavy axle and tire turnings.....	20.50 to 21.00

Per Net Ton

Iron angle bars.....	\$33.00 to \$33.50
Steel angle bars.....	27.00 to 27.50
Iron car axles.....	40.00 to 40.50
Steel car axles.....	40.00 to 40.50
Wrought arch bars and transoms.....	40.00 to 40.50
No. 1 railroad wrought.....	28.50 to 29.00
No. 2 railroad wrought.....	27.00 to 27.50
Railroad springs	28.50 to 29.00
Steel couplers and knuckles.....	29.50 to 30.00
Locomotive tires, 42 in. and over, smooth inside	36.00 to 36.50
No. 1 dealers' forge.....	26.00 to 26.50
Cast iron borings.....	15.00 to 15.50
No. 1 busheling	24.50 to 25.00
No. 1 boilers, cut to sheets and rings.....	22.00 to 22.50
No. 1 railroad cast scrap.....	25.50 to 26.00
Stove plate and light cast scrap.....	20.00 to 20.50
Railroad malleable	26.50 to 27.00
Agricultural malleable	25.50 to 26.00
Pipes and flues	23.00 to 23.50
Heavy railroad sheet and tank scrap.....	22.50 to 23.00
Railroad grate bars.....	20.00 to 20.50
Machine shop turnings.....	15.50 to 16.00
Country mixed scrap.....	19.00 to 19.50
Uncut railroad mixed scrap.....	23.50 to 24.00

Philadelphia

PHILADELPHIA, May 28.

Enlargement of war preparations, particularly in the manufacture of guns and ships, is the feature of present activity in the iron and steel trade. The Midvale Steel & Ordnance Co. is concluding arrangements with the Government for the construction of a large gun plant at Nicetown, Philadelphia, and workmen are already preparing for building operations. Another large gun plant may be built in this district for the manufacture of 18-in. guns. The Tacony Ordnance Corporation, Tacony, Philadelphia, will begin pouring steel for 6-in. and 9.5-in. gun forgings at its new plant on Wednesday. The Standard Steel Works Co., Burnham, Pa., is expanding its plant in several ways to provide more gun and other large forgings. A Camden plant is also at work making forgings for large guns. It is reported that there may be eventually at least six plants for making large guns, including the Steel Corporation and Midvale shops. Negotiations are now being conducted by the Ordnance Department with other companies.

Shipbuilding facilities will be expanded in a similar manner. In addition to two new Government shipyards, one on the Atlantic and one on the Pacific, which will be financed by the Government, there is a definite program of enlargement of all of the larger steel shipyards. In some instances this will include the con-

struction of new ways and new shops, or new equipment will be provided, so that the utmost speed can be attained in the construction of ships. The New York Shipbuilding Corporation, Camden, N. J.; the William Cramp & Sons Ship & Engine Building Co., Philadelphia; the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., and the Sun Shipbuilding Co., Chester, Pa., are among the larger yards which have planned for expansion. The Government will also increase the fabricating facilities of the country so that the tremendous tonnages of plates and shapes which are now being shipped from the mills may be made available as quickly as possible for the yards building fabricated ships.

Allocation of 392,000 axles for the cars contracted for by the Railroad Administration has been made to six companies. The tonnage involved is approximately 150,000. Plates and shapes for the cars have not been allocated at this writing. A western Pennsylvania steel company advised the Railroad Administration that it could roll a certain tonnage of shapes if Bessemer steel could be used. No answer had been received up to to-day. The specifications call for open-hearth steel, but it is believed that Bessemer may be substituted in some instances.

Pig Iron.—A large demand for low phosphorus pig iron for plants which will make forgings for large guns is the only feature of note in the local market. A crucible steel company has inquired for 12,000 tons for next year. Requirements of the United States Steel Corporation, Midvale Steel & Ordnance Co., and other companies, which expect to be making guns, are also before the iron makers. It is stated that arrangements must be made for putting an additional number of blast furnaces on low phosphorus iron, as the present production will not take care of the demand. The ore problem is not yet settled, but it is believed that importation of Spanish ore will be the way out. A local firm is prepared to bring as many shipments of ore from Spain as may be required, but will be unable to do so until the Shipping Board provides the necessary vessels. Responses to the questionnaires sent out by the Pig Iron, Ore and Lake Transportation Committee of the American Iron and Steel Institute, on behalf of the War Industries Board, have been made with dispatch. It is said that the information discloses that many foundries are far from being filled up with direct or indirect war work, and many foundrymen are worried lest their supply of pig iron be curtailed. From an official source it is learned that the expectation is that direct and indirect Government requirements will take all of the merchant iron that the furnaces of the country are able to produce. If this proves to be a correct interpretation of conditions, it would seem probable that the War Industries Board will be forced to allocate all of the merchant iron. Many consumers who have taken Government contracts find themselves in a quandary, as furnaces will not take their orders without the approval of the War Industries Board, and the board is refraining from acting as a purchasing agent as much as it possibly can. Many pending inquiries must be satisfied unless the Government is to lose the production of considerable important war material, and there seems no solution except that iron be taken away from foundries that have contracted for it for the less essential requirements. Typical instances of products now consuming iron, which may suffer great curtailment, are cast-iron toys, piano plates and heating furnaces. The toy and piano makers could doubtless present many arguments as to the essential character of their work, but it is regarded as unlikely that these will weigh against more urgent requirements for the war such, for example, as hand grenades. In this connection, it is interesting to note that a maker of hand grenades has had great difficulty in covering for about 3000 tons of foundry iron for this product. Pig iron men were discussing to-day the probable increase in the cost of iron on account of the advances in freight rates affecting coke, ore and other raw materials. As these rates go into effect on June 25, it is likely that furnaces will present new statements of costs to the War Industries Board when it considers the prices of iron

for third quarter. We quote standard grades of iron f.o.b. furnace, except Virginia iron, for which delivered prices are quoted:

Eastern Pennsylvania No. 1 X.....	\$34.50
Eastern Pennsylvania No. 2 X.....	33.50
Eastern Pennsylvania No. 2 foundry.....	33.00
Virginia No. 2 X (including freight).....	36.77
Virginia No. 2 foundry (including freight).....	36.27
Basic	32.00
Gray forge	32.00
Bessemer	35.20
Standard low phosphorus.....	53.00
Low phosphorus (copper bearings).....	50.00

Railroad Equipment.—Allocation of 392,000 axles for the cars to be built for the Railroad Administration has been made as announced in the Chicago market report. The price has been officially fixed at 4.25c., base, Pittsburgh, with a 20c. per 100 lbs. extra for rough turning the journals and wheel seats. The French High Commission is in the market for 6000 tires for French railroads, and these will probably be allocated by this Government. American railroads have not bought many tires during the past year or two, but inquiries are now being received by the mills, and will probably be increased as the plans for new equipment for the railroads are matured.

Coke.—There is no scarcity of coke, shipments coming to this district quite freely. Blast furnaces and foundries are being kept well supplied. We quote 48-hr. blast furnace coke at \$6 and 72-hr. foundry coke at \$7, Connellsville ovens.

Ferroalloys.—The Pittsburgh Crucible Steel Co., Midland, Pa., last week closed for 4000 tons of 16 to 18 per cent spiegeleisen at \$70, f.o.b. furnace, for delivery over the second half. This is the largest single order taken in some time. Spiegeleisen for spot delivery fetches from \$75 to \$80, about \$76 or \$77 at furnace being quoted by most furnaces. Ferromanganese is firm at \$250, delivered. The Andrews Steel Co., Newport, Ky., is in the market for 1000 tons of spiegeleisen and 500 tons of ferromanganese. The Midvale Steel & Ordnance Co. has inquired for 1500 tons of 11 to 14 per cent Bessemer ferrosilicon.

Structural Material.—It is stated on reliable authority that fully 300,000 tons of fabricated material will be up for quotations during the next three or four months, all of this being construction work that is directly or indirectly for the Government. It includes expansion of several shipyards, new manufacturing plants, warehouses and other buildings which are needed in connection with the war. As previously mentioned, the William Cramp & Sons Ship & Engine Building Co., Philadelphia, has asked for bids on a new building. The New York Shipbuilding Corporation, Camden, N. J., will greatly enlarge its shipyard. The Sun Shipbuilding Co., Chester, Pa., contemplates expansion of shop buildings. The Newport News Dry Dock & Shipbuilding Co., Newport News, Va., is also reported to have new construction work planned. Steps will undoubtedly be taken by the Government to increase the fabricating facilities of the country, as it is practically impossible for the present fabricating shops to get out all of the ship work and building fabrication that will be required of them during the remainder of the war. Commercial building work that requires structural material is completely in the discard. We quote plain material at 3c., Pittsburgh.

Plates.—Plate production continues at a high peak. The Army, Navy, Emergency Fleet Corporation and the railroads will continue to take all that the mills can produce for many months, in the opinion of producers. Their earlier optimism that plates might be available within a few months for commercial uses has been set aside by the declaration of Charles M. Schwab, director-general of the Emergency Fleet Corporation, that the shipyards would continue to take all the plates the mills could produce, and would, if necessary, pile the steel up in the shipyards against future requirements. The great expansion of the shipbuilding industry, which is now being planned, and the pressure for speed in every shipyard makes it seem possible that the shipbuilders will use more plates during the next year

than was thought possible two or three months ago. Many small boiler shops are now engaging in Government work, mainly the construction of boilers for ships, and are coming into the market for plates. We quote sheared plates, 1-4 in. and heavier, at 3.25c., Pittsburgh.

Iron and Steel Bars.—Shell bar requirements of the Government are so large that the rollings of commercial steel bars are greatly reduced. Makers of iron bars are having difficulty in shipping their product, as the railroads will take only those shipments which are for Government work. Very few of the rolling mills are able to attain maximum production because of inability to get sufficient raw material. We quote soft steel bars at 2.90c., Pittsburgh, and bar iron at 3.685c., Philadelphia.

Sheets.—In line with the announcement at the meeting of the American Iron, Steel and Heavy Hardware Association at Atlantic City, N. J., last week that jobbers would be able to obtain priority certificates for steel for war requirements, a jobber has been able to obtain a Government permit for more than 100 tons of sheets. We quote No. 10 blue annealed sheets at 4.25c., No. 28 black at 5c. and No. 28 galvanized at 6.25c., Pittsburgh.

Billets and Slabs.—A nearby steel plant is furnishing slabs, upon Government allocation, to a Pennsylvania plate mill, which is rolling these slabs into plates for the Government. We quote 4 x 4 in. open-hearth rerolling billets at \$50.50, Philadelphia.

Old Material.—Scrap dealers are, as a rule, well sold up; in some cases, for months ahead, and their principal job now is to find the scrap to apply on contracts. There is no surplus of scrap, but consumers seem to be able to get enough to satisfy their current requirements. The Pittsburgh district would buy heavily if the scrap could be obtained. Prices remain as quoted last week, the maximum, plus the commission, being paid on nearly all classifications sold by dealers. We quote for delivery at consumer's mill in eastern Pennsylvania as follows:

No. 1 heavy melting steel.....	\$29.00
Steel rails, rerolling.....	34.00
No. 1 low phosphorus heavy, 0.04 and under.....	39.00
Low phosphorus, 0.04 and under.....	36.50
Low phosphorus (not guaranteed).....	\$32.00 to 34.00
Old iron rails.....	39.00
Old carwheels.....	29.00
No. 1 railroad wrought.....	34.00
No. 1 yard wrought.....	33.00
Country yard wrought.....	29.00
No. 1 forge fire.....	26.00 to 27.00
Bundled skeleton.....	26.00 to 27.00
No. 1 busheling.....	31.00
No. 2 busheling.....	17.00 to 18.00
Turnings (for blast furnace use).....	17.50 to 18.00
Machine shop turnings (for rolling mill use).....	18.50 to 19.00
Cast borings (for blast furnace use).....	17.50 to 18.00
Cast borings (clean).....	19.00
No. 1 cast (for steel plant use).....	29.00
No. 1 cast (cupola sizes).....	33.00 to 34.00
Grate bars.....	24.00
Stove plate.....	24.00 to 25.00
Railroad malleable (for steel plants).....	28.00 to 29.00
Railroad malleable (for malleable works).....	31.00 to 32.00
Wrought iron and soft steel pipes and tubes (new specifications).....	33.00
Ungraded pipe.....	29.00

Cincinnati

CINCINNATI, May 28—(By Wire).

Pig Iron.—An erroneous report was circulated last week that changes in the high silicon iron schedule were retroactive and took effect April 1, instead of May 21. Where this rumor originated is not known, but it caused considerable annoyance. The questionnaires sent to iron melters from the committee at Cleveland through the furnaces and their representatives have been answered promptly by most foundrymen in this vicinity, and reports from different sources indicate that there has not been any general over-estimating of future requirements. One particularly

interesting result is that a few foundry iron melters have sufficient iron on hand to run them through the next four or five months. The announcement of a 25 per cent advance in freight rates has brought out urgent appeals for shipments on contracts and as the car supply in the South has been improved and all embargoes lifted, it is predicted that the movement of iron from the Birmingham district will be very heavy during the next three weeks. No sales are reported, and there is no iron offered, although some Southern furnaces have not sold their entire output for last half. The inquiry is now lighter and there is plenty of business in sight, but iron merchants cannot furnish the iron. An estimate made from the questionnaires returned from the foundries shows that about 65 to 70 per cent are operating on Government work either directly or indirectly.

Based on freight rates of \$2.90 from Birmingham and \$1.26 Ironton, we quote f.o.b. Cincinnati, as follows:

Southern coke, No. 2 foundry and No. 2 soft.....	\$35.90
Southern Ohio, No. 2.....	34.26
Basic, Northern.....	33.26

Finished Material.—The question of warehouse stocks is becoming somewhat serious, as mill shipments are coming forward at a very slow rate. It is almost impossible to get galvanized sheets, and as far as wire goods are concerned warehouse stocks are being depleted so fast that the jobbers have become somewhat alarmed and are using great care to supply their own customers and they are not now inclined to accept any outside business. The hope is generally expressed that the mills will be able within the next 60 days to satisfy the most urgent Government needs, so that there will be something left for general distribution. Reinforcing concrete rods are in fairly heavy demand, considering the slow building operations, and unless stocks are replenished it will be impossible to fill orders in a very short time. The high-speed steel business is good and shipments are going forward by express at a very satisfactory rate.

Jobbers' prices are as follows: Iron and steel bars, 4.08½c.; twisted bars, 4.36½c. base; structural shapes, 4.18½c.; plates, ¼-in. and heavier, 4.43½c.; No. 10 blue annealed sheets, 5.43½c.; cold rolled shafting, 10 per cent plus list. The mill price on No. 28 black sheets remains at 5.18½c., and on No. 28 galvanized, 6.43½c. The warehouse price on wire nails is now at \$4.10 per keg base.

Nonferrous Metal Scrap.—Dealers report very few transactions except in copper and brass scrap, which is in fair demand, but the supply is somewhat limited. Block tin pipe scrap is practically unobtainable and one dealer offers as high as 95c. a lb. delivered at his warehouse. No. 1 pewter is also strong and hard to get.

Old Material.—All contracts are now made subject to revision by the Government on July 1, and lately some fair-sized lots of both No. 1 machinery and No. 1 railroad wrought have been bought by different consumers. Most all of the material is to be shipped in the third quarter. Old iron rails are scarce and firm, and are now quoted around \$33.50 to \$34. Burnt scrap is also firm, and is quoted around \$17.50 to \$18 per net ton. Offerings are still light. The following are dealers' prices, f.o.b. at yards, southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet scrap.....	\$19.00
Old iron rails.....	\$33.50 to 34.00
Relaying rails, 50 lb. and up.....	44.00 to 44.50
Rerolling steel rails.....	31.50 to 32.00
Heavy melting steel scrap.....	26.00 to 26.50
Steel rails for melting.....	27.00 to 27.50
Old carwheels.....	28.50 to 29.00

Per Net Ton	
No. 1 railroad wrought.....	\$28.50 to \$29.00
Cast borings.....	13.00 to 13.50
Steel turnings.....	13.00 to 13.50
Railroad cast.....	25.00 to 25.50
No. 1 machinery.....	25.50 to 26.00
Burnt scrap.....	17.50 to 18.00
Iron axles.....	40.00 to 40.50
Locomotive tires (smooth inside).....	33.50 to 34.00
Pipes and flues.....	20.00 to 20.50
Malleable cast.....	24.50 to 25.00
Railroad tank and sheet.....	17.50 to 18.00

Coke.—The situation is unchanged in all of the producing fields with the exception that some complaints have been made that the hot weather makes it more

difficult to secure a supply of labor. There has not been a full supply of labor in all of the coke districts in over a year, and the usual troubles that arise in the summer are apt to make this situation worse. The car supply is fairly good, with the usual complaint as to shortages toward the end of the week. A few reports now coming in from both the foundries and the furnaces indicate that the quality of coke has lately shown some improvement.

Buffalo

BUFFALO, May 27.

Pig Iron.—Government business is the only kind that is being transacted, and furnacemen expect that such business will absorb the entire output of their stacks for a long period. There is no selling of iron for other purposes either for present or future deliveries, and the time when the disposal of iron for general uses can again be undertaken is very indefinite, although inquiries for iron of all kinds for such uses are numerous and pressing, and no bookings are being made. Shipments are going out in full volume on priority orders. Answers to the questionnaires sent out to all customers recently are being forwarded to the sub-committee of the American Iron and Steel Institute as rapidly as they are returned to furnaces with the required data, for the allocation of Government business. As intimated in previous report, one of the Tonawanda furnaces of the Donner Steel Co. is to be placed in operation on ferromanganese on May 29. We quote the current schedule of Government prices, f.o.b. furnace, Buffalo, as follows:

No. 1 foundry, 2.75 to 3.25 silicon.....	\$34.50
No. 2 X, 2.25 to 2.75 silicon.....	33.50
No. 3 foundry, 1.75 to 2.25 silicon.....	32.50
Gray forge	32.00
Malleable	33.50
Basic	32.00
Lake Superior charcoal, regular grades, f.o.b. Buffalo	37.50

Old Material.—Dealers report a notable increase in available stocks in many lines as scrap materials—particularly in shell turnings—of which there has been a large influx—and that there has been active demand for most of the commodities of the list and a fair total of business transacted. Shell turnings are being produced in increasingly large quantities and are coming into the market freely, but local consumption has been so heavy as to absorb most of the product, although some tonnages are going to Pittsburgh. There has been no change in the schedule of prices for the week. We quote as follows per gross ton, f.o.b. Buffalo:

Heavy melting steel.....	\$29.00
No. 1 low phosphorus, heavy, 0.04 and under..	39.00
Low phosphorus, 0.04 and under.....	36.50
Low phosphorus, not guaranteed.....	34.00
No. 1 railroad wrought.....	34.00
No. 1 railroad and machinery cast.....	34.00
Iron axles	\$44.00 to 46.00
Steel axles	44.00 to 46.00
Carwheels	29.00
Railroad malleable	34.00
Machine shop turnings.....	17.00 to 17.50
Heavy axle turnings.....	24.00
Clean cast borings.....	18.00 to 19.00
Iron rails.....	36.00 to 37.00
Locomotive grate bars.....	24.50 to 25.00
Stove plate	24.50 to 25.00
Wrought pipe	27.00 to 28.00
No. 1 busheling scrap.....	29.00 to 30.00
No. 2 busheling scrap.....	21.00 to 23.00
Bundled sheet stamping scrap.....	21.00 to 23.00

Finished Iron and Steel.—Practically all tonnages shipped are for Government work, and mills and agencies are devoting no time to the consideration of anything but requirements for Government war needs. There was less general inquiry this week than formerly, because users realize they cannot obtain material for general uses. Industry is more nearly on a war footing than ever before. Operating departments require that customers secure priorities for material already on the books and are declining to entertain new tonnage other than that required for direct war purposes. Plate mills of the district are operating 100 per cent on Government orders. The National Aniline & Chemical Co.,

Buffalo, has awarded the contract to the Pittsburgh Bridge & Iron Works for 250 tons of structural steel for a mechanical building, erection of which is being commenced. The same company is soon to take bids for a large 8-story warehouse of reinforced concrete which will require several hundred tons of reinforcing bars. The City Council of Erie, Pa., Faulkner G. Lynch, city engineer, is receiving bids for construction of 15,000 cu. yd. of reinforced concrete wall in connection with the Mill Creek Flood Control project, requiring 275 tons of reinforcing steel.

New York

NEW YORK, May 28.

Pig Iron.—Owing to the many demands of the Government, it has become necessary to know what need is most important, and foundry pig iron producers have been instructed to give preference to foundries which are making castings for the Emergency Fleet Corporation, the building of ships being regarded as the paramount consideration. Returns which are being received from customers indicate that from 65 to 95 per cent of the castings now being made are for Government business, direct and indirect, some companies doing much more Government business than others. The advance in freight rates is not causing any commotion, owing to the fact that so large a percentage of the business is for the Government and that prices are not now the most important matter. Considerable complaint is being heard in regard to the car supply. We quote as follows for tidewater delivery:

No. 1 X.....	\$35.25
No. 2 X.....	34.25
No. 2 plain.....	33.75
No. 1 Southern.....	\$39.75 to 40.25
No. 2 Southern (rail and water).....	39.00 to 39.25
No. 2 Southern (all rail).....	39.15 to 39.65
No. 2 X Virginia.....	37.02

Finished Iron and Steel.—In structural lines some more railroad and other Government work has been put on the market. Ten more buildings at Lake Denmark, N. J., are wanted, totaling 400 tons, and the Chesapeake & Ohio has added two bridges to its list, these taking 600 tons, and the Maine Central is in the market for 200 tons of bridge work. John Eichleay, Jr., has taken a contract for 2300 tons for the Greenwood shops of the Baltimore & Ohio. The Bethlehem Steel Bridge Corporation has been awarded the Culver Line elevated road in Brooklyn, 3600 tons. The American Bridge Co. will fabricate 850 tons for the David Lupton's Sons Co., Philadelphia, and 550 tons for remodeling the New Haven's Thames River bridge which is to be put to highway service. The Phoenix Bridge Co. will supply 400 tons for the Central Railroad of New Jersey. The Cambria Steel Co. will furnish 3000 tons of concrete bars for the supply store house, Boston. All of the 20,000 tons of ship material in storage on the Pacific Coast for Japan has left the country, leaving 80,000 tons more of such material which was contracted for to move when export licenses are obtained and also 75,000 tons which is to be rolled at Government prices in connection with the arrangement by which the United States secures Japan built ships. We quote: Steel bars, 3.095c.; shapes, 3.195c.; plates, 3.445c., and bar iron, 3.695c., all at New York. Out-of-store prices are 1c. higher.

Ferroalloys.—The ferromanganese market is moderately active, buyers generally showing a disposition to cover their requirements for the rest of 1918. In the last week there have been further sales at \$250, delivered, for 70 per cent alloy, and \$4 per unit above this standard, which is now generally accepted. One sale of 500 tons is noted and one of 300, the latter for delivery in the third quarter, besides a fair volume in carloads and up to 100 and 200 tons. Inquiry is fair. One consumer is asking for 500 tons for this year. While it has been understood that importations of 12,000 tons of British 80 per cent alloy would be permitted, it is reported that there is delay and some difficulty in obtaining licenses on this side. Indications are that May imports will be fairly large, close to 3000

tons. Those for April were 2575 tons. Activity continues to characterize the market for spiegeleisen, which is not as plentiful as ferromanganese. Sales include one lot of 1000 tons and another of 1500 tons for delivery this year, besides smaller lots in fair volume. The quotation is firm at \$70, furnace, for 16 per cent, and \$3.50 for each unit above this standard. There is an inquiry for 500 tons besides several for smaller amounts. Some large ones, formerly reported, are not yet satisfied. Ferrosilicon, 50 per cent, is fairly active, the past week having seen numerous sales for nearby and forward delivery. The minimum price for contract seems to be \$150 to \$155 per ton, delivered, with spot material bringing up \$175. Other ferroalloys in which there are few market changes from week to week are quoted in this paragraph in the first week of each month.

Cast-Iron Pipe.—As an example of the work that is being done by cast iron pipe shops for the Government it is stated that they have taken contracts for a large number of ash ejectors made almost entirely of cast iron for use on battleships. These and other orders are cited as evidence that cast iron pipe business should be given preference, but as yet no action has been taken by the Government and some shops are working on a hand-to-mouth basis, in the constant fear that they will not have enough pig iron to keep in operation. The new Government prices are now being quoted, but have not yet been tested. They are as follows: \$61.35, New York, for 6-in. and heavier, and \$64.35 for 4-in.; \$71.35 for 3-in., with \$1 additional for Class A and gas pipe.

Old Material.—The new freight advance on scrap will make the rate to Pittsburgh about \$4, and to eastern Pennsylvania \$3, including the Government tax, and this will necessitate a lowering of quotations named by dealers, as the scrap is sold on a delivered basis. This may have a tendency to retard the collection of scrap, as labor is now very high, the prevailing rate being \$19 to \$21 per week for common labor as compared with \$13 to \$14 per week at the time war was declared. Scrap dealers are having considerable difficulty in obtaining cars, as they are often not able to state positively that the material will be used for Government purposes. There is a demand for all the material obtainable at Government prices. We quote prices of brokers to New York producers and dealers as follows, per gross ton, New York:

Per Gross Ton	
Heavy melting steel.....	\$26.00 to \$26.50
Rerolling rails.....	31.50
Relaying rails.....	60.00 to 70.00
Iron and steel car axles.....	44.00 to 44.30
No. 1 railroad wrought.....	31.50 to 31.80
No. 1 railroad wrought cut to not less than 10 in. or over 24 in.....	36.50
Wrought-iron track scrap.....	29.50
Forge fire.....	23.50 to 24.00
No. 1 yard wrought long.....	30.50
Light iron.....	10.00 to 11.00
Cast borings (clean).....	16.00 to 16.50
Machine-shop turnings.....	16.00 to 16.50
Mixed borings and turnings.....	15.50 to 16.00
Iron and steel pipe (1 in. minimum diameter), not under 2 ft. long....	30.00 to 30.50
Stove plate.....	22.50 to 23.00
Locomotive grate bars.....	22.00 to 22.50
Malleable cast (railroad).....	31.00 to 31.50
Old carwheels.....	26.50
Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:	
No. 1 machinery cast.....	\$34.00
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	34.00
No. 1 heavy cast, not cupola size.....	29.00
No. 1 cast (radiators, cast boilers, etc.).....	\$27.00 to 28.00

In one of the worst storms that has ever swept over the Lehigh Valley, two Hoover & Mason ore bridges commanding the storage yard of the Bethlehem Steel Co. at South Bethlehem, Pa., were completely wrecked Monday night, May 27. The operation of the blast furnaces will not be interrupted, but for some time there will be a disarrangement of the receipt and handling of ore that goes on storage piles.

IRON AND INDUSTRIAL STOCKS

Stocks Tend to Lower Values at Prospect of Increased Taxation

Prospect of further Federal taxation, centered on income and excess profits, is held to be the underlying cause for a general trend in stocks toward lower levels. The volume of trading has fallen off quite sharply and the public holds a less prominent position in the market.

The range of prices on active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com. 30 1/2 - 37	Int. Har. Corp. com. 65
Allis-Chalm. pf. 86 - 86 1/2	Int. Har. Corp. pf. 95
Am. Can. com. 42 1/2 - 48 1/2	Lack. Steel 81 1/2 - 89
Am. Can. pf. 95 7/8	Lake Sup. Corp. 15 1/2 - 17 3/4
Am. C. & F. com. 74 3/8 - 80 7/8	Lima Loco. 47 - 50 1/2
Am. Loco. com. 62 - 68	Midvale Steel 46 1/8 - 54 1/2
Am. Loco. pf. 98	Nat. E. & S. com. 48 - 53 1/2
Am. Ship com. 120 - 139 1/2	Nat. E. & S. pf. 97
Am. Ship pf. 90 - 93	N. Y. Air. Brake 130 - 139
Am. Stl. Fdries. 61 - 68	Nova Scotia Steel 60
Bald. Loco. com. 79 1/4 - 98 1/8	Pressed Stl. com. 56 7/8 - 61 7/8
Beth. Steel com. 80	Pressed Stl. pf. 93 - 94 1/2
Beth. Stl. Class B 77 1/2 - 89 1/2	Ry. Stl. Spg. com. 53 3/4 - 56 3/8
Cambria Steel 126	Republic com. 81 - 90
Case, J. I. pf. 84 - 88 1/2	Republic pf. 99 - 99 3/4
Cent. Fdry. com. 37 - 40	Sloss com. 62 1/2 - 71 1/4
Cent. Fdry. pf. 46 3/4 - 47	Sloss pf. 93
Chic. Pneu Tool. 68 - 69 1/2	Superior Steel 37 3/8 - 43 1/4
Colo. Fuel 44 - 52 1/2	Transue-Wms. 39 - 39 3/4
Cruc. Steel com. 60 - 69 5/8	Un. Alloy Steel 39 - 42
Cruc. Steel pf. 91	U. S. Pipe com. 14 1/2 - 15 7/8
Gen. Elec. 142 3/8 - 150	U. S. Steel com. 102 1/2 - 110 7/8
Gt. No. Ore Cert. 30 1/4 - 33 1/2	U. S. Steel pf. 109 5/8 - 110 7/8
Gulf States Steel 84 - 88 3/4	Va. I. C. & Coke 72 1/8 - 73
Int. Har. of N. J. com. 124 - 128 1/2	Warwick 8 - 8 1/2
	Westing. Electric 40 1/2 - 45 1/8

Dividends

The American Laundry Machinery Co., quarterly, 1 1/2 per cent on the common, payable June 5.

The American Locomotive Co., quarterly, 1 1/4 per cent on the common, payable July 3, and 1 3/4 per cent on the preferred, payable July 22.

The Baldwin Locomotive Co., 3 1/2 per cent on the preferred, payable July 1.

The Brier Hill Steel Co., quarterly, 1 1/2 per cent and extra 3 1/2 per cent on the common, and 1 3/4 per cent on the preferred, payable July 1.

The General Electric Co., quarterly, 2 per cent and extra 2 per cent, payable in stock, both payable July 15.

The Gulf States Steel Co., quarterly, 2 1/2 per cent on the common, 1 3/4 per cent on the first preferred and 1 1/2 per cent on the second preferred, payable July 1.

The Lackawanna Steel Co., quarterly, 1 1/2 per cent and extra 2 1/2 per cent on the common, payable June 29.

The New York Air Brake Co., quarterly, 5 per cent, payable June 21.

The Railway Steel Spring Co., quarterly, 1 1/4 per cent on the common, payable June 29, and 1 3/4 per cent on the preferred, payable June 20.

The Standard Screw Co., quarterly, 6 per cent, payable July 1.

Electrochemical Society's New Officers

The thirty-fourth general meeting of the American Electrochemical Society will be held at Princeton University, Princeton, N. J., Sept. 30 to Oct. 2, immediately following the Annual Exposition of Chemical Industries in New York, the preceding week. The usual program of papers is being arranged.

At the annual business meeting held on the recent Southern trip of this society, the tellers of election reported the following new officers: President, F. J. Tone, of the Carborundum Co., Niagara Falls, N. Y.; vice presidents, Acheson Smith, H. W. Gillet, Robert Turnbull; managers, C. G. Schluederberg, E. L. Crosby, C. F. Burgess; treasurer, P. G. Salom and secretary Joseph W. Richards.

Cincinnati's Fine Record

CINCINNATI, May 28—(By Wire).—At noon to-day \$2,260,000 had been subscribed to the Red Cross Fund. This city's quota was \$1,125,000. All manufacturers have contributed liberally and workmen in machine shops have also taken special interest in the campaign.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb., New York, 19.5c.; Philadelphia, 18.5c.; Boston, 21.5c.; Buffalo, 11.6c.; Cleveland, 13.5c.; Cincinnati, 18.5c.; Indianapolis, 20c.; Chicago, 21.5c.; St. Louis, 27c.; Kansas City, 47c.; minimum carload, 36,000 lb.; St. Paul, 40c.; minimum carload, 36,000 lb.; Denver, 79c.; minimum carload, 36,000 lb.; Omaha, 47c.; minimum carload, 36,000 lb.; New Orleans, 30.7c.; Birmingham, 46c.; Pacific Coast, \$1.00; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is \$1.05, minimum carload, 40,000 lb.; and \$1.00, minimum carload, 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 40c., minimum carload 46,000 lb.; to St. Paul, 35.5c., minimum carload 46,000 lb.; Denver, 79c., minimum carload 46,000 lb. A 3 per cent transportation tax now applies. On iron and steel items not noted above, rates vary somewhat, and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, 1/2 in. thick and over, and zees, structural sizes, etc.

Wire Products

Wire nails, \$3.50 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails taking an advance over this price of \$2, and shorter than 1 in., \$2.50. Bright basic wire, \$3.35 per 100 lb.; annealed fence wire, Nos. 6 to 3, \$3.25; galvanized wire, \$3.95; galvanized barbed wire and fence staples, \$1.35; painted barbed wire, \$3.65; polished fence staples, \$3.65; cement-coated nails, \$3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 47 per cent off list for carload lots, 46 per cent for 1000-rod lots, and 45 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets, \$4.40 base
Large boiler rivets, \$4.50
7/16 in. x 6 in. smaller and shorter rivets, 50-10 per cent off list
Machine bolts h.p. nuts, 5/8 in. x 4 in.:
Smaller and shorter, rolled threads, 50-10-5 per cent off list
Cut threads, 50-5 per cent off list
Larger and longer sizes, 40-10 per cent off list
Machine bolts c.p.c. and t. nuts, 5/8 in. x 4 in.:
Smaller and shorter, 40-10 per cent off list
Larger and longer, 35-5 per cent off list
Carriage bolts, 5/8 in. x 5 in.:
Smaller and shorter, rolled threads, 50-5 per cent off list
Cut threads, 40-10 per cent off list
Larger and longer sizes, 40 per cent off list
Lag bolts, 50-10 per cent off list
Flow bolts, Nos. 1, 2, 3, 50 per cent off list
Hot pressed nuts, sq., blank, 2.50c. per lb. off list
Hot pressed nuts, hex., blank, 2.30c. per lb. off list
Hot pressed nuts, sq., tapped, 2.30c. per lb. off list
Hot pressed nuts, hex., tapped, 2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank, 2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped, 2.00c. per lb. off list
Semi-finished hex. nuts:
5/8 in. and larger, 60-10-10 per cent off list
9/16 in. and smaller, 70-5 per cent off list
Stove bolts, 70-10 per cent off list
Stove bolts, 2 1/2 per cent extra for bulk
Tire bolts, 50-10-5 per cent off list
The above discounts are from present lists now in effect.
All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$57; chain rods, \$65; screw, rivet and bolt rods and other rods of that character, \$65. Prices on high carbon rods are irregular. They range from \$70 to \$80, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16 in. x 4 1/4 in. and heavier, per 100 lb., \$3.90, in lots of 200 kegs of 200 lb. each, or more; track bolts, \$4.90. Boat spikes, \$5.25 per 100 lb., f.o.b. Pittsburgh.

Terne Plate

Effective Nov. 7 prices on all sizes of terne plates are as follows: 8-lb. coating, 200 lb., \$15 per package; 8-lb. coating, I. C., \$15.30; 12-lb. coating, I. C., \$16.75; 15-lb. coating, I. C., \$17.75; 20-lb. coating, I. C., \$19; 25-lb. coating, I. C., \$20; 30-lb. coating, I. C., \$21; 35-lb. coating, I. C., \$22; 40-lb. coating, I. C., \$23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. from mill, and 4.50c. to 5c. from warehouse in small lots for prompt shipment. Refined iron bars, 3.50c. in carload and larger lots, f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, as announced Nov. 5 by the Government on steel pipe, those on iron pipe being the same as quoted for some time:

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
1/2, 3/4 and 1	44	17 1/2	1 1/4 and 1 1/2	23	+4
1 1/2	48	33 1/2	2 1/4	24	+3
2 to 3	51	37 1/2	3	28	10
			3 1/2 to 1 1/2	33	17
Butt Weld			Lap Weld		
2	44	31 1/2	1 1/4	18	3
2 1/2 to 6	47	34 1/2	1 1/2	25	11
7 to 12	44	30 1/2	2	26	12
13 and 14	34 1/2	..	2 1/2 to 6	28	15
15	32	..	7 to 12	25	12
Butt Weld, extra strong, plain ends			Lap Weld, extra strong, plain ends		
1/2, 3/4 and 1	40	22 1/2	1 1/4, 3/4 and 1	22	5
1 1/2	45	32 1/2	1 1/2	27	14
2 to 3	49	36 1/2	2 1/4 to 1 1/2	33	18
	50	37 1/2			
2	42	30 1/2	1 1/4	19	4
2 1/2 to 4	45	33 1/2	1 1/2	25	11
4 1/2 to 6	44	32 1/2	2	27	14
7 to 8	40	26 1/2	2 1/2 to 4	29	17
9 to 12	35	21 1/2	4 1/2 to 6	28	16
			7 to 8	20	8
			9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5 1/2 points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh, announced Nov. 13, as agreed upon by manufacturers and the Government:

Lap Welded Steel	Charcoal Iron
3 1/2 to 4 1/2 in. 34	3 1/2 to 4 1/2 in. 12 1/2
2 1/2 to 3 1/4 in. 24	3 to 3 1/4 in. + 5
2 1/2 in. 17 1/2	2 1/2 to 2 3/4 in. + 7 1/2
1 3/4 to 2 in. 13	2 to 2 1/4 in. + 22 1/2
	1 3/4 to 2 1/2 in. + 35

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton	Per Net Ton
1 in. \$340	1 1/4 in. \$220
1 1/4 in. 280	2 to 2 1/4 in. 190
1 1/2 in. 270	2 1/2 to 3 1/4 in. 180
1 3/4 in. 220	4 in. 200
	4 1/2 to 5 in. 220

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days:

Blue Annealed—Bessemer	Cents per lb.
No. 8 and heavier	4.20
Nos. 9 and 10	4.25
Nos. 11 and 12	4.30
Nos. 13 and 14	4.35
Nos. 15 and 16	4.45

Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.80
Nos. 22 and 24	4.85
Nos. 25 and 26	4.90
No. 27	4.95
No. 28	5.00
No. 29	5.10
No. 30	5.20

Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	5.25
Nos. 12 and 14	5.35
Nos. 15 and 16	5.50
Nos. 17 to 21	5.65
Nos. 22 and 24	5.80
Nos. 25 and 26	5.95
No. 27	6.10
No. 28	6.25
No. 29	6.50
No. 30	6.75

Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.80
Nos. 17 to 21	4.85
Nos. 22 to 24	4.90
Nos. 25 and 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.05
Nos. 30 1/2 and 31	5.10

Metal Markets

The Week's Prices

May	Copper, New York		Tin, New York	Lead		Spelter	
	Lake	Electro- lytic		New York	St. Louis	New York	St. Louis
22....	23.50	23.50	\$1.02*	7.05	6.85	7.50	7.25
23....	23.50	23.50	\$1.01*	7.05	6.85	7.50	7.25
24....	23.50	23.50	\$1.01*	7.05	6.85	7.50	7.25
25....	23.50	23.50	\$1.00*	7.05	6.85	7.50	7.25
27....	23.50	23.50	\$1.00*	7.05	6.85	7.50	7.25
28....	23.50	23.50	\$1.00*	7.05	6.85	7.50	7.25

*Nominal.

Only moderate activity pervades the markets, the tone in general being strong. Government copper prices are to remain unchanged until Aug. 15. Tin is easier with prices quite a little lower on freer offerings. Lead is moderately active and firm. Spelter is quiet but steady. Antimony is lower.

New York

Copper.—Announcement has been made that the copper price of 23.50c. for carloads and 24.67½c. for less than carloads is to remain unchanged after June 1. It is understood the arrangement is to prevail until Aug. 15. Considerable disappointment is heard in some quarters but because of the fact that only 75 days is mentioned as the time for a continuance of the price, some expect an adjustment at that time. Demand is enormous but labor troubles are a hindrance to capacity output at refineries. The extent to which last summer's strikes affected production at smelters is revealed by the advance report of the U. S. Geological Survey for 1917. The smelter output last year was 1,886,120,721 lb. as compared with 1,927,850,548 lb. in 1916. The output of refined copper last year, however, was 2,507,663,067 lb. or nearly 143,000,000 lb. more than in 1916.

Tin.—The market continues quiet but more tin is being offered. The number of sellers is increasing, due to the supposedly easier Banca situation and the belief that it will continue so. The real facts about Batavia, however, are in doubt. It is supposed that ships with tin have sailed or will sail but reports conflict and nothing definite is really known. The market, however, is sagging and buyers are wary and but little business is reported actually done in the last week. The general situation has reversed itself as compared with a short time ago. Then there were more buyers than sellers but now there are more sellers than buyers. About 10 days ago shipment from the Far East sold at 97c. per lb., but to-day it can be bought down to 88c. and possibly lower, a decline of about 10c per lb. Spot tin is a little easier at \$1 per lb. nominal. Sales of small lots are heard of at \$1.03 per lb. No arrivals at Atlantic ports are reported since the 800 tons up to May 16 inclusive, noted a week ago, which is unusual. The London market continues to decline, yesterday spot Straits having been quoted nominal at £355 per ton, a decline of £8 in the week. The high mark was £381 early this month.

Lead.—Strength is added to the market daily and inquiry is more widespread. It is stated by one dealer that inquiries have been more numerous in the last week than in a month. The market is firm at 6.85c., St. Louis, or 7.05c., New York, with spot lead quoted at 7.25c., New York. There has been a fair volume of sales for forward delivery. The only feature in the general situation is the scarcity of prompt metal.

Spelter.—There is not much activity in prime Western but the market is firm at about 7.25c., St. Louis, or 7.50c., New York, for early delivery. This quotation has been slightly shaded to 7.20c., St. Louis, in one or two sales. One Western representative of certain producing interests has sold July-August-September delivery at 7.30c., St. Louis, though quite a few producers hold third quarter at 7.37½c., St. Louis, or 7.62½c., New York, and refuse to sell below this. Nearby and June delivery is generally quoted at 7.20c.

to 7.25c., St. Louis, with third quarter at 7.37½c., St. Louis. It is now officially announced that Grade A spelter is to continue at 12c. per lb. for about 90 days from June 1, with sheet zinc unchanged at 15c. per lb. and plate zinc at 14c.

Antimony.—As a result of considerable Government buying in the past month, the antimony market is dull and has declined gradually until now it is obtainable at 12.25c. to 12.50c., New York, duty paid.

Aluminum.—Government prices rule the market for No. 1 virgin metal, 98 to 99 per cent pure, and for scrap metal with 32c. asked for 50-ton lots, 32.10c for 15 to 50 tons and 32.20c. per lb. for 1 to 15 tons.

Old Metals.—Prices are generally unchanged. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible.....	23.50
Copper, heavy and wire.....	23.50
Copper, light and bottoms.....	21.00 to 21.50
Brass, heavy	16.25 to 16.50
Brass, light	12.00 to 12.25
Heavy machine composition.....	24.50 to 25.00
No. 1 yellow rod brass turnings.....	13.00 to 13.50
No. 1 red brass or composition turnings.....	20.50 to 21.00
Lead, heavy	6.50
Lead, tea	5.50
Zinc	5.75

Chicago

MAY 28.—The latter part of last week most of the markets were active. So far this week they are quiet, the inactivity being accentuated by the failure to receive advices from New York. Some selling was done in lead and tin, with the former the more active. The demand for copper is steady. We quote copper at 23.50c. for carloads and 24.67½c. less than carloads; tin, \$1.00 to \$1.15; lead, 6.90c. to 6.95c.; spelter, 7.25c. to 7.50c.; antimony, 14c. to 15c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 21c; copper clips, 21c.; copper bottoms, 19c.; red brass, 21c.; yellow brass, 14c.; lead pipe, 5c.; zinc, 4.50c.; pewter, No. 1, 60c.; tin-foil, 65c.; block tin, 70c.

St. Louis

May 27.—The non-ferrous metal market has been quiet the past week. The closing figures to-day were: Lead in carload lots, strong, with 7c. asked for chemical, and soft lead at 6.75c.; spelter, quiet, 7.37½c. to 7.50c.; less than carloads: Lead, 7.50c.; spelter, 8c.; tin, \$1.25, with none available; copper, 25.12½c.; Asiatic antimony, 15c. In the Joplin district the arrangements at Washington to maintain Grade A speiter at 12c. have had a strengthening effect and ores were firmly held. The top grades, basis of 60 per cent., were sold at \$75 per ton, with the second grades stiffer, though selling down to about \$47.50, the week's average being about \$55 per ton. Calamine was quiet at \$30 to \$34 per ton, basis of 40 per cent, with the week's average \$32. Lead was firm at \$85 per ton with reports of sales at higher figures, the week's average, basis of 80 per cent being \$85 per ton. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 10c.; heavy yellow brass, 14c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 20c.; pewter, 25c.; tin-foil, 55c.; lead, 5.50c.; tea lead, 5c.; zinc, 5c.

The contract for the construction of a nickel and copper refining plant at Deschenes, Que., for the British-American Nickel Corporation, has been awarded to the firm of Bate, McMahon & Co. According to T. C. Bate the plant must be completed before snow falls. It will be constructed entirely of concrete and will cost, including machinery, \$1,000,000. It is understood that both British and Norwegian interests are back of the plan. The production of refined metal from this plant will be very large, it is stated, and on a scale hitherto unknown in Canada. The British-American Nickel Corporation has mines in the Sudbury, Ont., district, where the smelters are located. Admiral Corresen, a Norwegian, who is head of a large copper refining company in Norway, has extensive interests in the proposed plant.

Cleveland

CLEVELAND, May 28.

Iron Ore.—The ore movement is heavier than earlier in the month, and shipments are now being made at the rate of approximately 9,000,000 tons per month, although the May movement will be less than that. One day last week 69 cargoes were loaded at upper Lake ports. The car supply at lower Lake docks is fairly good. We quote, f.o.b., Cleveland, lower lake ports, as follows:

Old range Bessemer, \$5.95; old range non-Bessemer, \$5.20; Mesaba Bessemer, \$5.70; Mesaba non-Bessemer, \$5.05.

Pig Iron.—The demand for pig iron for Government work shows a large increase. New inquiries that came out during the week on which allocations are now being made by the pig iron committee include the following: 8000 tons of low phosphorus iron for May-December delivery, and 600 tons for prompt shipment for the Watertown Arsenal; 14,000 tons of basic for a Monessen steel plant for May-December delivery to be used in making cable; 250 tons of foundry, and 50 tons of Bessemer ferrosilicon for the Panama Canal; 700 tons of Bessemer iron for a Detroit foundry for shell work; 100 tons of charcoal iron for Buffalo; 7500 tons of basic iron for Eddystone, Pa., August-March delivery; 2000 tons of foundry iron for the Cramp shipyards for July-December delivery; 1000 tons of 10 per cent Bessemer ferrosilicon for a Chicago steel plant for May-August delivery; 100 tons of foundry iron for Mare Island, and 4000 tons of basic iron for Pottstown, Pa., May-December delivery. Producers are reserving unsold iron to meet Government requirements. Some foundrymen are beginning to show anxiety about iron for next year's delivery, and are asking producers to advise them as soon as their books are opened. Shipments of Southern iron are now good, and consumers are asking that their iron be sent along as rapidly as possible. Many foundries are using a great deal more Southern iron than usual because of their inability to get Northern grades. There is considerable inquiry for small lots of Southern iron for prompt shipment, and the last-half delivery, but none is being offered. Production in many Cleveland foundries is being curtailed by the scarcity of common labor. Molders are apparently plentiful. We quote, f.o.b. Cleveland, as follows:

Bessemer	\$36.15
Basic	33.30
Northern No. 2 foundry.....	33.30
Southern No. 2 foundry.....	37.00
Gray forge.....	32.30
Ohio silvery, 8 per cent silicon.....	47.40
Standard low phosphorus, Valley furnace....	53.00

Bolts, Nuts and Rivets.—Bolt makers are getting a large volume of orders both for Government and commercial work, and while the demand is light for bolts used almost wholly in non-essential lines, the larger manufacturing plants are being rapidly filled up in most of their departments and are from 60 to 90 days behind on deliveries on some of their lines. Commercial consumers are getting under cover with contracts, and their orders are being accepted subject to the ability of manufacturers to make shipments after war essential industries are supplied. Rivet manufacturers have sent to the trade an announcement of the \$5 a ton reduction in prices announced last week by the Committee on Steel and Steel Products of the American Iron and Steel Institute. This reduction in price will apply to all rivets unshipped on old orders as well as on new business. New prices are 4.40c. for structural and shipyards, 4.50c. for boiler rivets and 50-10 discount on small rivets. The demand from shipyards is very heavy, considerable business at the present coming from the Pacific Coast.

Old Material.—Some consumers of heavy melting steel look for a reduction in scrap prices for the third quarter, and will not place any additional orders at present, as they have good stocks. The demand is rather quiet for all grades. Heavy melting scrap is still scarce, and dealers are having trouble in finding material to ship on their contracts. A Cleveland steel

plant which has been buying turnings has purchased 3000 tons of mixed borings and turnings at \$18.50 and 2000 tons of compressed steel scrap at \$29. A Cleveland rolling mill is reported to have purchased 500 tons of busheling at \$27 net. Most consumers are well supplied with this grade. Cast scrap is plentiful and in light demand. One sale of 400 tons is reported at \$34 gross delivered to a Pittsburgh consumer. We quote, delivered at consumers' yards in Cleveland and vicinity, as follows:

Per Gross Ton	
Steel rails.....	\$27.00 to \$28.00
Steel rails, rerolling.....	34.00
Steel rails, under 3 ft.....	34.50
Iron rails.....	39.00
Iron car axles.....	46.50
Steel car axles.....	46.50
Heavy melting steel.....	29.00
Cast borings	18.00 to 18.50
Iron and steel turnings and drillings..	18.25 to 18.75
No. 1 railroad wrought.....	34.00
Hydraulic compressed sheet scrap....	28.00 to 29.00
Cast-iron car wheels, unbroken.....	29.00
Cast-iron car wheels, broken.....	34.00
Agricultural malleable.....	24.00 to 25.00
Railroad malleable.....	34.00
Steel axle turnings.....	24.00
Light bundled sheet scrap.....	24.50 to 25.00
Cast-iron scrap.....	29.00
Cast-iron scrap, broken to cupola size	30.00 to 31.00
No. 1 busheling.....	29.50 to 30.00
Per Net Ton	
Railroad grate bars.....	21.00 to 21.50
Stove plate.....	21.00 to 21.50

Finished Iron and Steel.—There is a heavy demand on jobbers for finished iron and steel, and warehouse stocks are being rapidly depleted. Jobbers still have a fair stock of steel bars, and a small amount of structural material, but their other stocks of sheets and plates are well cleaned out. Shipments from mills to jobbing houses have been practically shut off, although some deliveries are being made of steel pipe in small sizes. Some jobbers are taking orders only for steel for Government work, but others are placing no restrictions on their sales. The 100 per cent production for the Government is necessitating the shutting down of some bar mills a part of the time, as plants not having Government orders for sizes that will keep certain mills in full operation must restrict production on these mills. The demand for discard steel is heavy, and sales of this steel rerolled into small billets are being made at \$51, the regular Government price for billets in small sizes. The allotment of 105,000 tons of steel for the 60 boats taken a few days ago by the American Shipbuilding Co. is expected shortly. The demand for bar iron on which the Government has not placed restrictions is fairly heavy, much of this coming from manufacturers who are substituting iron for steel. Mills are getting a great deal of direct inquiry for small lots of steel for Government work. The demand for sheets is heavy, both for Government and commercial work, and mills are taking orders only for the former. Commercial consumers are to some extent covering their requirements by buying in sizes that are available from stock lists. Some iron sheets are being supplied to the commercial trade by a Cleveland mill.

We quote warehouse prices as follows: Steel bars, 4.03½c.; plates, 4.38½c.; structural material, 4.13½c.; No. 10 blue annealed sheets, 5.35c.; No. 28 black sheets, 6.35c.; No. 28 galvanized sheets, 7.60c.

Coke.—A Cleveland furnace interest has a surplus of by-product coke which it is offering for prompt shipment. Shipments on contracts are being made in fairly good shape, and most foundries are now well supplied.

The Central Alabama Coal & Iron Co. has planned improvements to Jenifer furnace at Jenifer, Ala., including the building of a hot blast stove, 50 additional coke ovens, a new washer at the brown ore property near the furnace and the installing of considerable electrical equipment, also a machine shop.

Prices on some German iron and steel products, not heretofore under government regulation, were fixed recently and went into effect March 15. They include various kinds of bars and material for wire-drawing.

OBITUARY

JOHN HENRY OPTENBERG, Sheboygan, Wis., who retired several months ago as president and general manager of the Optenberg Iron Works, Sheboygan, because of ill health, passed away May 21 at the age of 66 years. He was born in Germany and came to America in 1860. He is credited with designing and constructing the first motor-driven road vehicle in the Middle West in the early '70s. This machine won a \$10,000 reward offered by the Wisconsin Legislature to stimulate progress in self-propelled vehicle engineering. The machine was steam driven and was developed later into the first steam treshing engine to be built in the United States.

LARZ WORTHINGTON ANDERSON, former president Cincinnati Shaper Co., died May 27 as the result of a throat operation, aged 51. Since retiring from business he had devoted most of his time to patriotic work, taking great interest in the Y. M. C. A. He was a great grandson of the first Nicholas Longworth, and was a graduate of Stevens Institute of Technology, Hoboken. He is survived by his wife and two sons, Larz F., at Great Lakes Training School, and Alexander, a student at Harvard.

RALPH W. WIGHT, treasurer Chapman Valve Mfg. Co., Indian Orchard, Mass., died May 20 in a New York hospital of pneumonia, following an operation. He was a prominent citizen of Springfield, Mass., having served as president of both branches of the city council and having been active in the work of commercial and civic associations.

WILLIAM DEWAR ELLIS, who was president of the Schenectady Locomotive Works when it was merged with the American Locomotive Co. some years ago, died May 23 at his home in New York, aged 63.

ALBERT W. GIFFORD, 82 years old, vice-president of the Standard Screw Mfg. Co. at Worcester, Mass., died at his home in that city last week.

Coming Meetings of Gas Engine Societies

The Society of Automotive Engineers, mid-West section, and the National Gas Engine Association will hold their first joint meeting at the Hotel Sherman, June 4. The afternoon meeting will be a technical session consisting of a paper on the "Mechanical Construction of Ignition Magnetos," by H. R. Van Deventer of the Sumter Electrical Co., Chicago. A paper on the "Hvid Engine" will be presented by E. B. Blakely, advisory engineer, Sears, Roebuck & Co., Chicago.

The joint meeting will be followed by an informal dinner at 7 p. m. at the Hotel Sherman. George W. Smith, chairman of the mid-West section, and assistant chief engineer Nash Motors Co., Kenosha, Wis., will preside. O. H. Fisher, president National Gas Engine Association, and president Union Gas Engine Co., Oakland, Cal., will speak. This joint meeting is the first since the society took over the technical work of the National Gas Engine Association.

Well over 700 reservations have been made for the Orville Wright dinner at the Dayton meeting of the society, June 17 and 18. Governor Cox of Ohio will make an address. On Monday, June 17, W. B. Stout, technical advisor of the Aircraft Board, will discuss "Present Day Problems in Aeronautics"; Fay B. Faurote of the Curtiss Aeroplane & Motor Co. will talk on "Airplanes of To-day," and F. W. Caldwell, aeronautic engineer of the Aviation Section of the United States Army, will give a paper on "Propeller Design." The subject of the "Design of Exhaust Mufflers for Aeronautic Engines" will be discussed in a paper by Archibald Black. A paper on the "Processes of Petroleum Refining" is to be presented by C. W. Stratford, petroleum technologist. A separate session devoted to tractor engineering will be held on June 18.

Cast-Steel Shell Blanks for the Government

A domestic company which for some time has been devoting the output of one of its plants for nearly two years to producing 9.2-inch cast-steel shell blanks for the British Government is now starting to make similar blanks for the United States Government. The British blanks were all shipped direct to England and were of acid open-hearth steel. The same plant is now converting its four acid open-hearth furnaces to basic and one is already operating basic.

The same company at another of its plants is filling a large Government order for a new cast-steel shell blank, called the bottle-neck type. It is cast with a tapering end which runs into a neck or protrusion similar to a bottle, this being used as a handle when forging the ingot into a shell. The ingot itself is about 24 in. in diameter and perhaps 36 in. long over all, and is finally reduced by forging into a 12-in. shell. The same plant is making also large octagonal ingots about 17 ft. long and 36 in. in diameter which are sent to a forging plant to be converted into guns.

An interesting feature of the open-hearth furnace practice of this company at one of its plants is that, owing to the shortage at times of low-phosphorus pig iron and the abundance of turnings and scrap, 25-ton heats have been successfully made in which the charge has consisted of 95 per cent scrap, with the use of 5 per cent pig iron or pig iron and petroleum coke. This steel is cast into shell blanks.

Army Orders 8000 Motor Trucks

Orders for 8000 motor trucks for the United States Army have just been placed. Sixteen companies are expected to share the order, 15 having already signed contracts. They are: Gramm-Bernstein Motor Truck Co., Lima, Ohio; Kelly-Springfield Motor Truck Co., Springfield, Ohio; Indiana Truck Corporation, Marion, Ind.; Service Motor Truck Co., Wabash, Ind.; Republic Motor Truck Co., Alma, Mich.; Selden Truck Co., Rochester, N. Y.; Bethlehem Motor Corporation, Allentown, Pa.; Diamond T. Motor Car Co., Chicago; United States Motor Truck Co., Cincinnati; Brockway Motor Truck Co., Cortland, N. Y.; Healy Motor Corporation, Moline, Ill.; Sterling Motor Truck Co., Milwaukee, Wis.; Garford Motor Truck Co., Lima, Ohio; Packard Motor Truck Co., Detroit; and Hurlburt Motor Truck Co., New York. These companies will do assembling work chiefly, parts having been ordered from other concerns, and will receive an assembling price of \$567 per truck. They are to complete deliveries between Aug. 1 and Dec. 1.

The Firestone Steel Products Co., Akron, Ohio, has been organized with the following officers: H. S. Firestone, president; R. J. Firestone, vice-president; A. C. Miller, vice-president; J. G. Swain, vice-president and factory manager; S. G. Carkhuff, secretary; J. G. Robertson, treasurer. The new company has absorbed the business of the Firestone rim plant which did a \$4,000,000 business last year, supplying demountable rims to 132 car manufacturers out of a possible 184 and making from 50 per cent to 60 per cent of the solid truck tire rims used in the United States. The stock in the new company is held for the Firestone Tire and Rubber Co. with the exception of the directors' qualifying shares.

The Holtzer-Cabot Electric Co., Roxbury, Boston, announces that its business in motors, dynamos, generators, etc., previously conducted by the James Goldmark Co., 83 Warren Street, New York, will hereafter be handled from its New York office at 101 Park Avenue. Douglas Cairns is in charge.

Contracts have been let by the Baltimore and Ohio Railroad Co. for the erection of a large roundhouse and turn-table at Grafton, near Clarksburg, W. Va. The improvements are to cost about \$280,000.

Machinery Markets and News of the Works

GREAT WAR ACTIVITY

Equipment Required for Shipbuilding Expansion

Demand for Cranes Shows a Sudden Spurt—Reports of More Gun Plants

Shipbuilding expansion, the creation of new gun-making facilities and the plans of the railroads for equipment expenditures have brought a new stimulus to the machinery trade, particularly in the demand for cranes and fabricating machines. The inquiry at present for cranes is larger than at any time since the period last fall when the new shipbuilding plants were getting started.

Most important of the new projects is a plan of the Emergency Fleet Corporation to build two Government-owned shipyards, one on the Atlantic and one on the Pacific, each having complete shops for fabricating, machine work, forging, etc. The crane requirements will possibly total 200 overhead electric cranes, in addition to about an equal number of hoists. From 60 to 100 punches, shears and other fabricating machines are also being inquired for.

About 40 overhead electric cranes will also be required for the gun plants to be built by the United States Steel Corporation and the Midvale Steel & Ordnance Co., but detailed specifications have not yet been issued. There are many miscellaneous crane inquiries, which are given in detail in the New York market report.

Nearly all of the large steel shipyards are expanding. The New York Shipbuilding Corporation, Camden, N. J., is adding a number of new shipways and is extending its shops. Within the past few weeks it has purchased about 20 punches and other machines. Eight 15-ton cranes were purchased last week by this shipyard from the Pawling & Harnischfeger Co., Milwaukee, Wis., and other cranes are being inquired for. The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., is also inquiring for a list of machinery. A new boiler shop is being constructed at that plant. The William Cramp & Sons Ship & Engine Building Co., Philadelphia, and the Sun Shipbuilding Co., Chester, Pa., are also about to expand.

The Skinner & Eddy Corporation and the Seattle Construction & Dry Dock Co., Seattle, Wash., have consolidated, and the new corporation has received a contract for ships aggregating a cost of \$100,000,000. Great Lakes shipyards, which have received additional contracts—for a total of 130 steel ships, are adding to their equipment. Several new shipyards are being projected. Fabricating facilities will be increased by the Government calling for much plate-working machinery.

Inquiry for small and medium-sized machine tools is relatively light, but there is a large demand for heavy machinery for both shipyards and gun plants. Impatience is shown by builders of large tools because the Ordnance Department appears not to be

ready to place orders for the large tools which will be required for the Steel Corporation and Midvale gun plants. It is reported that other gun works are under consideration. It is expected that a list of equipment for the Steel Corporation plant will appear soon. Several large hydraulic presses will be required, the largest having a maximum pressure of 15,000 tons.

Westinghouse Church Kerr & Co., New York, will be in the market soon with a list of machine tools for the locomotive repair shop they will construct at Glenwood, Pa., for the Baltimore & Ohio Railroad. A list of the crane requirements was published in THE IRON AGE of May 23.

There is an active demand from varied sources for machine tools in the Chicago market. Several hand and rifle grenade contracts have been placed. Contracts in that territory for 155-mm. shells are pending. The Chicago, Indianapolis & Louisville Railway has issued a small list.

In Cleveland there is a good demand. The Grant Motor Corporation, Cleveland, has taken a large contract for 6-in. shells. Its requirements include 20 turret lathes. The New York Central has issued a list of about 30 tools.

Cincinnati machine-tool builders have received a list of tools from the Ordnance Department for shipment to Pittsburgh. The list includes 100 18-in., 100 20-in., 50 26-in. and 30 32-in. lathes.

Additional shell orders have been placed in Canada by the United States Government. New plants for the manufacture of war materials are being built in Montreal and Toronto. A United States company, represented by the Holden Morgan Co., Toronto, has acquired a site for a large munitions plant and will turn out larger shells than any hitherto made in Canada.

The Bureau of Supplies and Accounts, Navy Department, Washington, has asked for bids on 68 engine lathes, 11 milling machines, 18 screw machines, also turret lathes, grinders, boring and slotting machines, planers and shapers.

New York

NEW YORK, May 28.

Two new Government-owned shipyards will be constructed by the Emergency Fleet Corporation, one on the Atlantic and one on the Pacific. Several crane builders were summoned one day last week to furnish quotations on the crane requirements, which will be exceptionally large. Lists were presented to them for quotations showing that 67 overhead electric cranes will be required for the shops at each shipyard, in addition to tower whirley cranes, which will be used over the shipways. The total number of cranes may reach 200. In addition, from 60 to 100 punches, shears and other plate-working machines will be bought.

Very little information was given as to the details of the new shipyards, but it is understood that each will have 10 shipways and its own fabricating and machine shops, forge shops, etc. The fabricating and manufacturing capacity of the country is so well taken up with work for existing shipyards that the plan is to create new facilities for fabricating the steel and making turbines, boilers and all ship parts. Plans for the vessels, which are to be of about 9000 tons deadweight, are said to have been completed.

In addition to the overhead electric cranes, about 40 locomotive cranes will be required, builders being asked to

bid on 30 of 15-ton capacity and 10 of 20-ton. A large number of machine tools will also be required, but lists of these have not yet been issued.

About 40 overhead electric cranes will be required for the two new gun plants to be constructed by the United States Steel Corporation and the Midvale Steel & Ordnance Co. Detailed specifications have not been sent out. There will probably be two more large gun plants in the East, one of which may build guns of 18-in. bore. This plant, if built, will be an extension of a plant now in operation, while the other may be undertaken by a steel company not now engaged in gun manufacture.

Crane inquiry in the past week has come in a flood. Some builders of cranes have had very few orders within the past few months, and deliveries of 60 to 90 days have been quoted. A few of the large builders are, however, sold up for six months to a year. The Phelps Dodge Corporation, New York, has inquired for seven cranes, one 60-ton, one 40-ton, two 20-ton, one 5-ton and two 2-ton, all for copper works in the West. The Hay Foundry & Iron Works, Newark, N. J., is in the market for two 10-ton cranes of 37½-ft. span and one 10-ton crane of 47-ft. span. The Federal Shipbuilding Co., New York, has inquired for four 10-ton cranes of 70-ft. span. The American Car & Foundry Co., New York, will buy two 10-ton cranes of 90-ft. span, one 5-ton of 90-ft. span, and another 5-ton of 90-ft. span, with 30-ft. cantilever extensions on each end. The J. G. Brill Co., Philadelphia, is inquiring for one 20-ton crane of 50-ft. span and one 5-ton of 24-ft. span. The Reading Steel Castings Co., Reading, Pa., wants a 20-ton crane of 60-ft. span. The Ingersoll-Rand Co., New York, wants one 10-ton crane of 56½-ft. span for its Phillipsburg, N. J., shop. The Bayonne Steel Casting Co., Bayonne, N. J., will buy one 5-ton crane of 33-ft. 8½-in. span. The Crucible Steel Co. of America, Harrison, N. J., wants a 5-ton bucket handling crane of 36-ft. span.

The William Cramp & Sons Ship & Engine Building Co., Philadelphia, has closed with the Champion Engineering Co., Kenton, Ohio, for four 15-ton cranes of 112-ft. span. The Morse Dry Dock & Repair Co., Brooklyn, N. Y., has bought two Northern cranes of 20 and 25-ton capacity. The Merchant Shipbuilding Corporation, Bristol, Pa., has placed an order with the Champion Engineering Co., Kenton, Ohio, for one 15-ton, double trolley gantry crane of 85-ft. span and three 10-ton double-trolley gantry cranes of 85-ft. span.

Machine-tool inquiry is comparatively light. There is some impatience among builders of large tools because the Ordnance Department is not yet ready to place orders for the \$15,000,000 worth of large tools required for the gun plants at Pittsburgh and Philadelphia. In some quarters it is believed that the requirements of the Government might be met if orders were placed promptly, but it appears that the Ordnance Department has prepared only tentative lists of its requirements.

The Wright-Martin Aircraft Corporation, which gave out a number of large verbal orders a week ago for machine tools for the plant of the General Vehicle Co., Long Island City, N. Y., which it has acquired, has temporarily withdrawn these orders for reasons not announced. The trade understands, however, that formal orders will eventually be placed, and the quantity bought will probably be double that ordered a few weeks ago.

The General Electric Co. has purchased the business of the Bijur Motor Lighting Co., Hoboken, N. J., and the new plant which this company occupied about a year ago is being vacated and it will occupy its former plant again. The new Bijur plant will be turned over to the Remington Arms U. M. C. Co., which will enlarge its facilities for the manufacture of small arms ammunition. New equipment will probably be bought soon.

The Standard Oil Co. of New York has made purchases of fabricating equipment and machine tools totaling \$100,000 or more for a new refinery at Providence, R. I.

Railroad buying has not materialized as yet in any volume, but a few inquiries, mostly for single tools, have been received from the New York, New Haven & Hartford, the Central Railroad of Vermont and the New York Central. The Central Railroad of New Jersey has bought quite a number of new tools.

Shipbuilders are buying new equipment, the New York Shipbuilding Corporation, Camden, N. J., having bought six punching machines and other equipment. The American International Shipbuilding Corporation, Philadelphia, has inquired for seven punching machines and one gate shear.

The International Aeronautical Instrument Corporation, New York, has been incorporated, with a capital of \$10,000, by A. L. Haustetter and T. L. Zimmerman, Jr., 55 Liberty Street.

The Abeles-Lalley Light Corporation, New York, has been

incorporated, with a capital of \$30,000, to manufacture electric light and power plants for individual installation. L. Fischel, 242 West Seventy-second Street; H. H. Seabrook, 510 Audubon Avenue, New York; and S. Andrews, 12 Locust Street, Flushing, L. I., are the incorporators.

The Decorated Metal Mfg. Co., 196 Degraw Street, Brooklyn, has had plans prepared for remodeling two four-story buildings adjoining its works into a factory for an extension to its plant. A new one-story addition, 38 x 40 ft., will also be erected. The improvement is estimated to cost \$20,000.

The Voepel-Thirion Co., New York, has been incorporated with a nominal capital of \$5,000 by F. Thirion, D. and D. Voepel, Jr., 1140 Clay Avenue, to manufacture ornamental iron products.

The Waterflow Alarm Co., New York, has been incorporated with a capital of \$10,000 by L. Leitman and L. L. Colodny, Mount Vernon, to manufacture automatic alarm devices.

The Parkerton Wire Works, 149 West Eighteenth Street, New York, has been incorporated with a capital of \$10,000 by E. R. Katz, M. Weinberg and W. H. Parkerton.

The British American Metals Co., 52 Vanderbilt Avenue, New York, has increased its capital from \$100,000 to \$1,000,000.

The Testile Piston Ring Co., Freeport, L. I., manufacturer of piston rings, etc., has awarded a contract to Frederick S. Howell, Pearsall Avenue, Freeport, for the construction of a one-story brick and concrete works, 50 x 100 ft., on the Merrick Road, at a cost of \$14,000.

The Lubricup Mfg. Co., New York, has been incorporated with a capital of \$250,000 by F. D. Lincoln, F. T. Craven and F. J. Knorr, 50 Church Street, New Rochelle.

The Industrial Appliances Corporation, New York, has been incorporated with a capital of \$10,000 by J. J. Sullivan, N. V. Rothenberg and M. C. Kahl, 35 Nassau Street, to manufacture telephone and telegraph devices.

A one-story engine shop, 38 x 100 ft., to cost \$15,000, will be erected by the Long Island Railroad, Pennsylvania Terminal, New York, at Sixty-fourth Street and Eighth Avenue, Brooklyn.

The Roman Bronze Works, Greene Avenue, Brooklyn, has been incorporated with a capital of \$100,000. A. A. Bertini, M. M. Hiron and A. Rathheim, 44 Cedar Street, New York, are the incorporators.

The United American Metal Corporation, 50 East Forty-second Street, New York, has increased its capital from \$500,000 to \$1,000,000.

The Paper Container Industry, Inc., New York, has been incorporated with a capital of \$35,000 by H. Siegel, 276 Ninth Avenue, and P. Feinberg, 136 West Twenty-first Street, to manufacture box-making machinery.

The Pearson Engineering & Machine Co., Brooklyn, has been incorporated with a capital of \$20,000 by C. O. Pearson, J. T. Booth and L. V. Hulse, 271 Broadway.

The new six-story concrete plant of S. Karpen & Brothers, 68 Thirty-fourth Street, Brooklyn, to be erected on Jackson Avenue, between Harold and Hulst streets, Long Island City, will cost \$722,000.

The Decorated Metal Mfg. Co., 196 Degraw Street, Brooklyn, has awarded a contract to the H. D. Best Co., 52 Vanderbilt Avenue, New York, for an extension to its present plant to cost \$20,000.

The American Smelting & Refining Co., Perth Amboy, N. J., has awarded a contract to Ira R. Crouse, 495 State Street, Perth Amboy, for an addition to cost \$10,000.

The Threadless Pipe Fitting Co., Newark, has been incorporated with a capital of \$30,000 by Samuel Lederman, Joseph G. Fenster and Edward S. Schwartz.

The Maas & Waldstein Co., Avenue R and Passaic River, Newark, will build a one-story foundry, 30 x 40 ft., at its chemical works. It will also erect a boiler and a nitrating works to cost about \$65,000. The structures will be one-story, 55 x 215 ft., and 55 x 128 ft., respectively. Contract for the latter work has been awarded to Henry M. Doremus & Co., 36 Orange Street, Newark.

The Foster Engineering Co., 109 Munro Street, Newark, manufacturer of automatic valves, etc., has increased its capital from \$50,000 to \$350,000.

The Sanders Mfg. Co., 294 Eighth Avenue, Newark, manufacturer of food choppers, grinders, etc., has completed plans for a one-story and basement addition, 22 x 80 ft., to cost \$12,000.

The Humana Co., 19 Clinton Street, Newark, manufacturer of printing presses, has leased a building at 56 Summer Avenue for a new works.

A one-story, reinforced-concrete power plant, 37 x 70 ft., will be erected by the Heller & Merz Co., Newark, at its chemical works on Hamburg Place.

George J. Cross & Co., Newark, have filed notice of organization to operate a plant at 104-6 Vernon Avenue for the manufacture of fountain pens. George J. Cross, 119 Wickliffe Street, heads the company.

The George W. LeCompte Co., Newark, has filed notice of organization to operate a plant at 328 Adams Street for the manufacture of automobile parts. George W. LeCompte, 433 Meeker Street, South Orange, heads the company.

The Standard Wire Co., 11 Passaic Avenue, Harrison, N. J., has purchased the three-story factory, 110 x 200 ft., on the west side of Passaic Avenue, formerly occupied by the Federal Wire Cloth Co., as an addition to its works.

The J. Edward Ogden Co., Center Street, Bayonne, N. J., manufacturer of bolts, etc., has increased its capital from \$150,000 to \$250,000.

The Enameling & Stamping Corporation of New York has purchased the plant formerly operated by Fickling Enameling Corporation at Second Street and Webster Avenue, Long Island City, for enameling wood and metal surfaces, and has equipped it for enameling in colors, brushing, spraying, dipping, flowing, tumbling, etc. W. I. Fickling is president, and H. F. Holbrook, formerly president of Holbrook Co., is secretary and treasurer.

The Ramberg Iron Works, Inc., Imlay and Pioneer streets, Brooklyn, operating a ship construction and repair works, has acquired 8½ acres on the Buttermilk Channel East River adjoining the plant of the New York Dock Co., and will use it for extensions to its works.

The Grote Transmission Co., New York, has been incorporated with a capital of \$15,000 by A. W. Grote, W. B. Mott and H. S. Cook, 219 West Eighty-first Street, to manufacture automobile transmissions.

L. R. Wood, Inc., New York, has been incorporated with a capital of \$50,000 by M. H. and L. H. Wood, and C. F. Hoffman, 49 Wall Street, to manufacture electrical goods.

The Bureau of Yards and Docks, Navy Department, Washington, plans construction of a new structural shop at the Brooklyn Navy Yard, to cost about \$1,000,000. The Norcross Brothers Co., 103 Park Avenue, New York, is the contractor. The Bureau is also reported considering the construction of a series of drydocks at Weehawken, N. J., to cost over \$8,000,000.

Buffalo

BUFFALO, May 27.

The Buffalo General Electric Co., Buffalo, has filed plans for an enlargement of its generating plant on Staats Street, to cost \$33,700.

The L. C. Ritter Estate, 815 Seneca Street, Buffalo, has prepared plans for a one-story forge shop, 31 x 100 ft., which it will erect on Seneca Street, near Fillmore Ave.

Cousins & Son, boilermakers, Buffalo, will build a works at Hopkins and Tift streets and the South Buffalo Railroad, of mesh steel and concrete, to cost \$25,000; also an office building, 20 x 33 ft. J. Cousins, 74 Wabash Street, is president.

The United States Radiator Co., Dunkirk, N. Y., is completing plans for an addition to be erected at once.

General contract for an addition to the drop forge plant of the General Electric Co., Schenectady, has been awarded to the Austin Co., Cleveland. Three other additions are contemplated.

The Art Metal Construction Co., Jamestown, N. Y., has had plans drawn by F. A. Shoemaker, engineer, Builders Exchange Building, Buffalo, for extending its boiler house.

The Buffalo Cereal Co., Buffalo, will erect and equip an electric power plant for its new grain elevator and mill at Abbott Road and the Lake Shore Railroad.

The Northern New York Utilities Co., 137 Arsenal Street, Watertown, N. Y., is completing plans for a power development at Black Carthage, N. Y., estimated to cost \$500,000. F. A. Rogers is vice-president and general manager.

The American Hollow Boring Co., maker of hollow bored forgings, spindles, piston rods, camshafts, etc., 1055 West Nineteenth Street, Erie, Pa., has completed its new plant and is now on production. Charles E. Mueller is secretary.

The Crucible Steel Co. of America, Magnolia Avenue, Syracuse, N. Y., has filed plans for the erection of an addition to cost about \$50,000.

The M. H. Merchant Corporation, Syracuse, has been incorporated with a capital of \$75,000 by L. G. Sheldon, L. C.

Hardy and M. H. Merchant, Syracuse, to manufacture chain tighteners for motor cars, etc.

The Binghamton Cutlery Works, Binghamton, N. Y., organized as a subsidiary of the International Razor Co., Indianapolis, Ind., with capital of \$1,000,000, will establish a new works at Binghamton for the manufacture of cutlery, razors, shears and kindred specialties. A site has been selected and it is proposed to commence operations about July 1 with about 100 workers. Motor-driven equipment will be installed. Power will be furnished by the Binghamton Light, Heat & Power Co.

The Ordnance Department, Washington, has filed a petition condemning a tract of land at North Buffalo, extending from Kenmore Avenue, Kenmore, to the boundary line of Tonawanda. The property, about 1 mile square, will be cleared and used by the Department for aircraft work. It is said that an airplane works will be erected in conjunction with an airplane testing field and will operate in connection with the works of the Curtiss Aeroplane & Motor Corporation.

The Acme Pattern & Machine Co., 1553 Niagara Street, Buffalo, has increased its capital from \$20,000 to \$150,000.

The La France Motor Truck Co., Elmira, N. Y., has filed notice of reorganization, with an active capital of \$57,500.

New England

BOSTON, May 27.

Business with machine tool builders has not been particularly brisk this week, although a good volume of small orders is steadily coming in. There is a wide variance in the different plants in regard to the condition of deliveries, but on the whole deliveries of the smaller sizes of machine tools seems to be better. There is a noticeable decrease in the number of new enterprises and in new construction. Business in other metal-working plants continues at top capacity with a general attempt to increase the output to keep up with the steady placement of Government orders.

The Terry Steam Turbine Co., Hartford, Conn., has increased its capital stock from \$350,000 to \$700,000. It is asking bids for an additional story to two sections of its plant, 40 x 100 ft. and 20 x 200 ft.

The Loxon Co., Boston, has been incorporated with authorized capital stock of \$250,000 to manufacture machinery, motor vehicles, airplanes, etc. Osman Royal, Portland, Ore., is president and treasurer.

The American Can Co., Bridgeport, Conn., has awarded a contract to the T. J. Pardy Construction Co. for an addition, 44 x 66 ft., one story, to its plant on Hollister Avenue.

The Manning Gauge Co., Medford, Mass., has been incorporated with authorized capital stock of \$10,000. Coleman J. Manning, 63 Grant Avenue, is president and treasurer.

Landers, Frary & Clark, New Britain, Conn., have awarded a contract to the Torrington Building Co. for an addition, 30 x 105 ft., two stories.

The Norwalk Foundry & Machine Co., Norwalk, Conn., has been incorporated with authorized capital stock of \$125,000. It will begin business with a capital of \$10,000.

The Bridgeport Brass Co. is increasing its holdings of land near its Housatonic branch on the water front. No plans have been made for immediate use of the land.

The Taft-Pierce Mfg. Co., Woonsocket, R. I., has awarded to the Eastern Construction Co. a contract for an addition, 60 x 130 ft., four stories.

S. Lapiques, 553 Oak Street, New Haven, Conn., has awarded a contract to Parante Brothers for a foundry, 35 x 40 ft., one story.

The Koehler Mfg. Co., Marlboro, Mass., has awarded a contract to the J. E. Warren Co. for an addition, 40 x 90 ft., one story.

The Pratt & Whitney Co., Hartford, Conn., is to build a boiler house, 60 x 68 ft., one story.

The Continental Metal Co., 362 Carpenter Street, Providence, R. I., has awarded to the C. I. Bigney Construction Co. a contract for a machine shop, 30 x 30 ft., one story.

The American Brass Co., Waterbury, Conn., has begun the erection of an addition, 30 x 137 ft., one story, at its plant on Washington Avenue.

The New Britain Machine Co., New Britain, Conn., has awarded to the Aberthaw Construction Co., Boston, a contract for a factory, 114 x 340 ft., one story, to be built on a site recently acquired on the Berlin branch of the New York, New Haven & Hartford Railroad.

The Premier Printing Machinery Co., Boston, Mass., recently organized, has purchased the entire business and

properties of the Potter Printing Press Co., Plainfield, N. J., the Whitlock Mfg. Co., Derby, Conn., and the United Printing Machinery Co., Woonsocket, R. I.

Philadelphia

PHILADELPHIA, May 27.

The New York Shipbuilding Co., Camden, N. J., will immediately build seven new shipways at its plant on the Gloucester side of Newton Creek, effecting a total of 17 shipbuilding berths constructed at the plant this year. In connection with the new ways, machine shops, erecting shops and forge buildings will be constructed. The complete extension is estimated to cost \$6,000,000. The works now occupy a total area of about 160 acres, giving employment to 11,000 men. With 12 main shop buildings, all material used in construction is fabricated in the yard, including the construction of boilers and engines. Rough castings, plates, etc., have up to the present time been produced by outside plants, with finishing and fitting work handled on the grounds. Since the commencement of the war the works have been tripled in size, with present total of 24 shipways, and with the new extensions, 31 shipways. The present crane installation consists of one 100-ton overhead crane for fitting out work; one 35-ton traveling gantry crane, and two 40-ton locomotive cranes. New cranes will be required for the seven additional shipways.

The Swift Aircraft Mfg. Co., Camden, N. J., has been incorporated with a capital of \$50,000 by Kenneth Robertson and John A. Davenport, Philadelphia; T. L. Bear and John F. Leavitt, Camden, and John M. Meadman, Collingswood.

Berko Brothers, Randolph and Wood streets, Philadelphia, operating a wire works, will build a two-story addition, 18 x 50 ft.

The new electric power plant to be erected by the Bureau of Yards and Docks, Navy Department, Washington, at the League Island Navy Yard, Philadelphia, will be one and two-stories, of brick and reinforced concrete, to cost about \$130,000.

The Diamond State Clay Products Co., Philadelphia, has been incorporated in Delaware with a capital of \$100,000 by John H. Schall and C. L. Bundy, Philadelphia, and William C. Brister, Ambler, Pa., to manufacture pottery.

The L. H. Gilmer Co., Cottman Street, Philadelphia, manufacturer of belting, will build a one-story brick addition, 42 x 100 ft., to its plant at Tulip and Bleigh streets.

The Campbell Irrigation Co., Philadelphia, has been incorporated with a capital of \$100,000 by F. R. Hansell, Philadelphia, and S. C. Seymour, Camden, N. J., to manufacture irrigation machinery.

The A. H. Fox Gun Co., North Eighteenth Street, Philadelphia, will operate its Wayne Junction works for the manufacture of parts for heavy-type Browning guns, co-operating with the Colt's Patent Fire Arms Mfg. Co.

The Auto Car Co., Ardmore, Pa., is considering the erection of a four-story addition on Lancaster Avenue.

The Driscoll-Reese Steel Casting Works, at Hamburg, Pa., a new steel foundry, began operations May 10. Paul P. Reese is president.

The Trenton Malleable Iron Co., New York Avenue, Trenton, has broken ground for a one-story addition, to cost \$10,000.

Fire, May 14, destroyed a large part of the works of the Quertimont Glass Co., Elm Street, Fair Chance, Pa., with a reported loss of \$80,000.

Baltimore

BALTIMORE, May 27.

The G. A. Anderson Mfg. Co., Bush and Russell Streets, Baltimore, brass founder and machinist, has increased its capital stock from \$25,000 to \$90,000.

The Baltimore Gas Appliance & Machine Co., Bayard Street, Baltimore, has purchased property on Hamburg Street, near Bayard, and plans an addition to its works.

The American Locomotive Co., Richmond, Va., is taking bids for three one-story additions on North End Boulevard, including a foundry, each 50 x 150 ft., to cost \$25,000.

A. W. Briggs, Alexandria, Va., and associates have organized a company to manufacture aircraft. The former Pioneer Mills, foot of Duke Street, has been acquired for the works.

The Concrete Shipbuilding Co., Savannah, Ga., has been incorporated with a capital of \$50,000 by Ira Widing, H. S. Wells and Jesse Dimmick.

R. C. Camp and associates, Fernandina, Fla., will estab-

lish a local yard for building barges and tugs. It is proposed to provide the new plant with 10 shipways and shops, erecting buildings, etc. The new works, including machinery and equipment, are estimated to cost about \$1,000,000. John A. Ryan and James T. Farrington are promoting the company.

The Pensacola Vessel Construction Corporation, Pensacola, Fla., recently organized, has acquired a site near Pensacola for its proposed plant. The initial works will comprise seven shipways and auxiliary structures. F. M. Blount is president.

The Machine Repair Co., Mobile, Ala., recently incorporated with a capital of \$25,000, has acquired the plant of the Modern Welding & Blacksmithing Co., Mobile, and will operate it under the new name. M. Benjamin Scholtes is president.

The Central Alabama Coal & Iron Co., Jenifer, Ala., which recently purchased the Jenifer blast furnace, will build a new machine shop and other shop buildings at the works, in connection with general improvements to the furnace. Electrical equipment for operation will also be installed.

Chicago

CHICAGO, May 27.

The active buying movement in the local machine-tool market has been strengthened the past week and has become so urgent as to appear feverish. A large business in small lots and in large tools makes up the bulk of orders. A decided spur to buying is the recent placing of hand and rifle grenade contracts, resulting in orders for quite a number of small lathes, sensitive drilling machines, tappers, etc. Still further impetus and a not inconsiderable source of buying is contributed by the brisk business in agricultural implements, tractors, etc. Price advances of 10 per cent have been made on some important lines the past week.

The Chicago, Indianapolis & Louisville Railway, purchasing department, Chicago, has issued a list calling for four 36-in. x 12-ft. engine lathes, four 24-in. x 10-ft. engine lathes, four 42-in. boring mills with bar head, three 30-in. planers, two air compressors of 1500 cu. ft. per min. capacity, and one of 500 cu. ft. per min. capacity.

It is reported that the Nash Motor Co. has let some of its contracts to the Lavine Gear Co., Racine, Wis., and that both companies are buying considerable equipment. The Casey-Hudson Co., Chicago, has obtained a Government contract and is adding to its equipment. Several contracts are pending for producing 155-mm. shells, none of which has been placed as yet.

The Bunting Boiler Co., Lowell Avenue, Chicago, is having plans prepared for a one-story boiler works, 75 x 200 ft., on Sixteenth Street, to cost \$30,000.

A one-story power plant to cost about \$10,000 will be erected by the Woodstock Typewriter Co., North Dearborn Street, Chicago, at its works at Woodstock, Ill.

The Invincible Blow Pipe Co., Homer Street, Chicago, has filed plans for a one and two-story plant, 50 x 100 ft.

The Link-Belt Co., Chicago, has broken ground for a three-story and basement addition to its plant at Indianapolis, Ind., 105 x 130 ft.

The Green Foundry & Furnace Works, Des Moines, Iowa, is having plans prepared for a four-story foundry addition to cost about \$75,000. F. D. Chase, South Michigan Avenue, Chicago, is the architect.

The Production Tool & Engineering Co., Chicago, has been incorporated with a capital of \$12,000 by Samuel W. Banning, 140 South Dearborn Street, Thomas A. Banning and Ephraim Banning.

The McCormick Works of the International Harvester Co. will build an addition to its tractor works at West Thirty-first Street, Chicago, where the manufacture of castings for farm tractors will be centralized. The building will cost in the neighborhood of \$500,000 and it is expected that the annual output will be 20,000 to 25,000 tons.

The Clyde Iron Works, Duluth, Minn., will build an addition to its plant which will nearly double the size of its machine shop and general offices. Anthony Puck is the architect.

The Shane Automatic Signal Mfg. Co., Denver, Col., is building a \$15,000 plant at 2200 South Delaware Street for the manufacture of furnaces, automatic traffic signals and railroad crossing gates. Machinery to the value of \$25,000 will be installed.

The DePere Mfg. Co. has plans for two additions to its plant at DePere, Wis., one of which will be used for a machine shop.

Milwaukee

MILWAUKEE, May 27.

New orders for machine-tools placed with manufacturers in this district the past week or 10 days form an enormous volume, although the requirements consist mainly of small lots. The demand continues exceptionally broad and more pressing, perhaps, than at any time since the beginning of the war. The trade is working at a capacity that never before has been reached and is limited only by the supply of labor and other physical factors. Despite this high production, it appears as if the supply of tools forms a small percentage of the demand, with little prospect that the condition will be relieved for some time.

The Cutler-Hammer Mfg. Co., Milwaukee, which is devoting practically its entire capacity to the manufacture of electric controlling devices for the Navy Department, has awarded contracts for the construction of a brass, bronze and aluminum foundry, 40 x 75 ft., costing about \$15,000 complete.

The Globe Shipbuilding Co., Superior, Wis., has awarded the general contract for designing and erecting a steel, concrete and brick machine and molding shop, 80 x 200 ft., to the Lakeside Bridge & Steel Co., North Milwaukee, Wis. B. C. Cooke is president and general manager.

The Lavine Gear Co., Racine, Wis., has awarded the general contract for the erection of a new machine shop and manufacturing building, 175 x 275 ft., at Keefe Avenue and North Pierce Street, Milwaukee, to the Dahlman Construction Co., Milwaukee. It will be of reinforced concrete, steel and brick, one story, and cost about \$350,000 with equipment. The company manufactures steering gears and other parts for automobiles, motor trucks and tractors. It was erroneously stated that Herman A. Uhlein, Milwaukee, is the owner; Mr. Uhlein is president of the company.

The Nash Motors Co., Kenosha, Wis., will erect another machine-shop addition, 50 x 200 ft., one story, to its motor truck manufacturing plant.

The Enterprise Foundry Co., Superior, Wis., has been organized by S. A. Riches and associates and is converting a two-story concrete building at Ogden Avenue and First Street into a gray iron foundry. The cupola has been contracted for and is expected to be delivered about June 15. Meanwhile the shop is being remodeled and several small additions made. The new interest has booked sufficient business to operate at capacity for several months.

The Wisconsin Wire & Iron Works, 1650 Booth Street, Milwaukee, has started work on the erection of a one-story addition, 60 x 80 ft., to its wire-weaving shop and will install several additional looms and other equipment, most of which has been contracted for. E. A. Ernest is vice-president and general manager.

The Crucible Steel Casting Co., 612 Clinton Street, Milwaukee, will build a brick foundry addition at a cost of \$10,000.

The Richardson-Phenix Co., 122-128 Reservoir Avenue, Milwaukee, manufacturer of lubricating devices and apparatus, has awarded contracts for the construction of a one-story reinforced concrete addition, 60 x 110 ft., to its assembling shop, at a cost of \$12,000. John W. Peterson is general manager.

The Service Auto Spring Co., Milwaukee, has been incorporated with a capital stock of \$9,000 to manufacture automobile springs. The incorporators are Theodore H. Seefeld, Charles P. Mosden, Jr., and Jacob Widmeyer.

The Aerial Cutlery Co., Marinette, Wis., is taking bids through Derrick Hubert, architect, Menominee, Mich., for the erection of a two-story brick factory addition, 30 x 130 ft., which will cost \$20,000 with equipment.

Menningen & Karth, Milwaukee, who recently acquired the machine-shop of F. A. Gardner at Seventy-fifth and National avenues, West Allis, have plans for a two-story addition, 50 x 80 ft., and are buying a small lot of light tools.

The H. W. Johns-Manville Co., 201 Clybourn Street, Milwaukee, will build a one-story addition, 60 x 140 ft., to its plant at Forty-third and State streets, town of Wauwatosa.

The Marwin Motor Truck Co., Kenosha, Wis., recently incorporated with an authorized capital of \$1,000,000, has been awarded a Government contract for three-ton quadruple drive trucks and is equipping the former plant of the Skidd Mfg. Co., Janesville, Wis. The following officers have been elected: President, William Martinson, Kenosha; vice-president, A. F. Williams, Chicago; secretary and treasurer, Henry Lundskow, Kenosha; chairman executive committee, Martin P. Winther, Kenosha; director, N. S. Faucett, Washington, D. C. Mr. Martinson is general manager of the Winther Motor Truck Co., Winthrop Harbor, Ill., and Mr. Winther is president and chief engineer of the same company.

Detroit

DETROIT, May 27.

Demand for standard machine-tools by manufacturers of munitions continues to hold the market above normal. An increased call for woodworking machinery has brought the total of orders above the average of the past year.

The labor situation grows more serious. Several thousand women are engaged in local munition plants, but even this class of labor is hard to secure. The labor shortage in Detroit alone is well past the 20,000 mark. Shipbuilding and other large companies working on war orders are the most seriously handicapped. Similar conditions are reported throughout the State. Munition plants in Jackson desire 2000 women, at wages nearly equal those of men, while the demand for female labor in Saginaw, Pontiac, Muskegon, and other industrial centers is greater than the supply.

The coal situation is also causing considerable anxiety. Very little coal is coming into the district, due partly to the refusal of dealers to stock up until a fair margin of profit has been determined by the State Fuel Administrator.

Contracts for 24 vessels to cost approximately \$800,000 each, or a total of more than \$19,000,000, has been awarded to the Great Lakes Engineering Works, Detroit. In all, 130 such ships will be built on the Great Lakes. The American Shipbuilding Co. will construct 60; the Manitowoc Shipbuilding Co., 12, and the remainder will be divided among the Toledo Shipbuilding Co., the McDougall Duluth Shipbuilding Co., and the Globe Shipbuilding Co., Duluth. The ships will be of 4200 gross tons, net weight capacity, and will have 1500 hp. Deliveries are to be completed by the end of the shipping season of 1919.

The Ford Motor Co., Detroit, has mobilized a force of 1200 tool makers and within a few weeks will produce 100 Liberty motors daily.

The Michigan Metal Supply Co., Inc., Detroit, which had its headquarters at 601 Kerr Building, has removed to larger quarters at 501 Book Building. It is manufacturers' agent for the Rickert-Shafer Co., Erie, Pa., maker of automatic dieheads, and for the Victor Tool Co., Waynesboro, Pa., maker of collapsible taps.

The Chalmers Motor Co., Detroit, has received a contract from the Government for 1,500,000 mine anchors, and is also turning out artillery caterpillar tractors.

The Mott Mfg. Co., Dundee, Mich., has removed to Adrian, Mich., where it will manufacture small tables, tools and pedestals.

The name of the Holley Kerosene Carburetor Co., Detroit, has been changed to the Holley Carburetor Co. and the capital stock increased from \$100,000 to \$150,000.

The Traction Motor Corporation, Kalamazoo, has perfected its organization and started the manufacture of tractors in the plant of the Dunkley Co. The officers are: President, George L. Erwin; vice-presidents, Edmond Hans and Myron H. Powell; secretary, G. J. Wagner.

The Ruggles & Pearsons Traction Co., Alma, Mich., in which the Republic Motor Truck Co. is heavily interested, has expanded beyond the capacity of its plant and is considering the erection of another.

The Michigan Copper & Brass Co., 1611 West Jefferson Avenue, Detroit, has completed an addition to its plant, 184 x 300 ft., at a cost of \$185,000.

The Gray Motor Co., Detroit, has increased its capital stock from \$500,000 to \$1,000,000.

Cleveland

CLEVELAND, May 27.

Several large new inquiries have developed for machine tools for Government work, the demand for which has been limited for some time to single tools and small lots of machinery. The Grant Motor Corporation, Cleveland, has taken a large order for 6-in. shells which will be manufactured in its Findlay, Ohio, plant. It is doing a large amount of Government work, but until the present time has not been engaged in the manufacture of shells. Its requirements include 20 heavy turret lathes and considerable other machinery, which is being placed. The New York Central Railroad has issued a list of about 30 machines for its Central Western shops. Some additional equipment has been placed by an Ohio ordnance plant. The large orders placed at Lake shipyards by the Emergency Fleet Corporation a few days ago for additional boats for 1919 delivery will necessitate increasing the capacity of these yards, and will probably result in the placing of additional machine-tool equipment. The American Shipbuilding Co. has placed an order for two 5-ft. radial drills and is inquiring for a 42-in.

boring mill. There is a good demand for boring mills and planers and the scarcity of these tools appears to be more pronounced. Boring mills can be had for delivery about Sept. 1 on Class A priority orders, but some planer manufacturers are unable to promise shipments before January or February of next year.

The New York Central Railroad has issued through its purchasing department in Cleveland the following list of machines for its various shops in the Central West: One combination grinder; one 42-in. heavy-duty planer; one 36 x 36-in., 12-ft. bed planer; five 24-in. high-duty shapers; one 1 1/4-in. drill press; two 104-in. boring and turning mills; one 42-in. boring mill; one punching machine with 12-in. throat, with capacity to drill 1-in. hole through 1-in. steel; one 30-in. power cold saw; one No. 3 rotary bevel shear; one 96-in. 500-ton hydraulic wheel press; one 24-in. slotter; two universal tool grinders; one 3 1/2-ft. radial drill; one 24-in. x 12-ft. engine lathe; one 4-in. turret lathe; one 18-in. x 14-ft. engine lathe; one 30-in., 6-ft. 6-in. centers, engine lathe; one 26-in x 10-ft. back geared engine lathe; one 18-in. x 8-ft. engine lathe; one 24-in. x 8-ft. engine lathe; one 3-in. x 36-in. turret lathe; one 18-in x 8-ft. lathe; one 6000-lb. steam hammer.

The Boehm Metal Stamping Co., Cleveland, has erected a new plant at 2217 West Sixty-first Street. Jacob Boehm is the proprietor.

The Lakewood Engineering Co., Cleveland, has placed a contract for the erection of a new factory and office building.

The Fanner Mfg. Co., Cleveland, will build a two-story addition, 60 x 230 ft., for storage and office purposes.

The new ordnance works being erected by the Morgan Engineering Co., Alliance, Ohio, is nearing completion and it is expected that the entire plant will be ready about June 15. One of the machine shops was put in operation several weeks ago.

It is announced that the plant and business of the North Electric Co., Galion, Ohio, will be taken over by a new corporation to be known as the North Electric Mfg. Co., with a capital stock of \$3,000,000. The Telephone Improvement Co. and other subsidiaries will be merged into the new corporation.

It is announced from Lorain, Ohio, that the Michigan Foundry Co., Detroit, will erect a new foundry in that city.

The Timken Roller Bearing Co., Canton, Ohio, has acquired the property of the Goheen Mfg. Co., which it plans to use for extensions.

The Kelly Machine Co., Mt. Gilead, Ohio, will enlarge its plant by the erection of a machine shop, 30 x 60 ft.

Cincinnati

CINCINNATI, May 27.

The new Government regulations covering men within the select age will relieve the labor situation to a large extent, that is, as far as common labor is concerned. Skilled labor has been drawn on quite heavily, and even plants having rush Government contracts have lost some of their best mechanics. The manufacturers generally think that this new regulation will unearth a number of men with mechanical ability who will be able to fill up the gap to a certain extent.

The demand for boring mills of all sizes is very insistent and the supply was never as short as at the present time. Second-hand mills of all sizes are almost impossible to obtain. No large lists of machine tools have been issued lately except the one given below, and buying has generally been done on a small scale. In some cases, however, orders are limited to the capacity of the machine-tool builder's plant. A little better demand for shaping machines is reported. All of the portable electric drilling and grinding machine makers are very busy and have orders booked as a general rule several weeks ahead.

The Ordnance Department has lately issued a list for machine tools to be shipped to Pittsburgh. Quick delivery is wanted, but this will be almost impossible, except on a few sizes of lathes. The list includes 100, 18-in.; 100, 20-in.; 50, 26-in., and 30, 32-in. lathes.

Plans for the new foundry of the Peerless Foundry Co., in St. Bernard, Cincinnati suburb, have now been completed. The main building will be 120 x 200 ft., one story. The storing and shipping department will occupy a building 60 x 120 feet. Contract for the structural steel work has been let to the Union Foundry Co., South Dearborn Street, Chicago.

The Pollak Steel Co., Cincinnati, has secured permit for a two and one-half story brick and frame office building estimated to cost \$20,000. Its plant is located in Carthage, a suburb.

Work is progressing rapidly on the addition to the plant of the Cincinnati Pulley Machinery Co., Covington, Ky., which should be in operation by July 1.

Machinery is being installed in the plant of the Liberty Machine Tool Co., Hamilton, Ohio, and it is expected to have it in operation within 10 days.

The American Beet Harvester Co., Middletown, Ohio, has been incorporated with \$100,000 capital stock by Walter B. Smith and others to fit up a plant to manufacture a beet-harvesting machine. Manufacturing quarters have been secured in a building on Basin Street.

Work has commenced on a three-story brick and concrete addition to the plant of the French Oil Mill Machinery Co., Piqua, Ohio. It is 25 x 60 ft., and will house the foundry. A. W. French is president.

The Williamson Hydraulic Machine Co., Mt. Vernon, Ohio, has been incorporated with \$50,000 capital stock by R. Williamson and others. Nothing is known as to manufacturing plans.

The Wilmington Saw Mill Co., Wilmington, Ohio, has been incorporated with \$50,000 capital stock by T. A. McCaslin and others.

Indianapolis

INDIANAPOLIS, May 27.

The Standard Electric Engineering Co., Hammond, Ind., has been incorporated with \$100,000 capital stock to manufacture mechanical and electrical apparatus. The directors are A. R. Stowell, George M. Chapin, and Roy W. Weir.

The Angola Electric Mfg. Co., Angola, Ind., has been incorporated with \$150,000 capital stock to manufacture machinery. The directors are Samuel C. Wolf, Edward C. Kolb and Carl A. Redding.

The Nelson Aeroplane Corporation, Indianapolis, has been incorporated with \$50,000 capital stock to manufacture airplanes and parts. The directors are Herbert G. Humphrey and Arthur Nelson.

The LaGrange Hardware Co., LaGrange, Ind., has been incorporated with \$20,000 capital stock to manufacture tin and sheet metal products. The directors are Clyde A. and Ira B. Walb and Valentine D. Weaver.

The Central South

LOUISVILLE, May 27.

Due to the shortage of war orders in this district the Board of Trade and the Louisville Industrial Foundation have again taken up the matter of placing a resident representative in Washington to look after local interests in the matter of war orders. As a rule the boiler and pump plants have about all the business they can handle, but the general run of foundries and metal-working establishments have not been especially busy.

The Owensboro Forging Co., Owensboro, Ky., will rebuild its burned plant at a cost of \$25,000. Some of the heavy trip hammers will be repaired, but a considerable portion of the machinery will have to be replaced.

A contract has been received by the National Car & Foundry Co., Jeffersonville, Ind., for construction of 1000 small cars, 12 x 10 x 5 ft., for the National Powder Co. They will be principally of galvanized steel.

The Louisville Machinery Co., Louisville, has been incorporated with a capital of \$5,000 to manufacture supplies and auto parts. R. R., E. B., and John Rollin are the incorporators.

Morgan & Hamilton, Nashville, Tenn., bag manufacturers, are building a \$25,000 concrete addition to their plant, and will install motor-driven machinery.

S. L. Dodds, Hickman, Ky., operator of an electrically driven cotton gin, has let contract to L. N. Gregory for an addition to his plant.

The Anglo American Mill Co., Owensboro, Ky., manufacturer of flour milling machinery, will erect a \$50,000 addition to its plant, and will install additional equipment.

The Henderson Box & Lumber Co., Henderson, N. C., will install a 150-hp. boiler, engines and a 150-kw. direct-connected generator.

The Waggoner, Phillips, Barnes Co., care of Bristol Ice Co., Bristol, Tenn., desire data concerning ice machinery.

The Elkhorn Superior Block Coal Co., Whitesburg, Ky., has increased its capital from \$35,000 to \$100,000. It is planning the installation of new electrical machinery.

St. Louis

St. Louis, May 27.

The Moon Motor Car Co., St. Louis, having obtained a Government munitions contract, will equip an addition to its plant which will require large machines.

The Liberty Airship Co., Muskogee, Okla., has been organized by D. F. Felton, W. H. Steuve and H. K. Herbst and will equip a plant for the manufacture of airplanes.

Villa Platte, La., is receiving bids for alternators, generators, motor-driven pumps and other machinery for its electric light plant. A. C. Jones, Opelousas, La., has plans and specifications.

The Citizens Consolidated Power & Electric Co., Poteau, Okla., has been incorporated with a capital stock of \$25,000 by Wiley W. Lowrey, H. J. Fowler and E. S. Hutton and will erect a plant.

The Chickasha Surety Oil Refining Co., Chickasha, Okla., has been incorporated with a capital stock of \$500,000 by B. M. Kennedy and A. M. Yowell, Wichita Falls, Tex., and will equip a refinery.

The Junction City Lumber Co., Urbana, Ark., will re-equip its burned plant, requiring about \$40,000 worth of machinery.

The Bush Nut & Products Co., Shawnee, Okla., Fred A. Bush, J. A. Deering, and others interested, will equip a plant for the manufacture of nuts, requiring about \$10,000 worth of machinery.

The Bankers Mining Co., Joplin, Mo., I. P. Jones, president and manager, will install about \$25,000 worth of machinery in its concentrating plant.

The Bates-Rogers Construction Co., New Orleans, La., will equip a plant at New Orleans, La., for building barges.

Kansas City, Mo., Burton Lowther, chief engineer, will expend \$1,500,000 on waterworks plant equipment, including two 20,000,000-gal. pumps and other machinery.

The plant of the Break Creek Lumber Co., Leaksville, Miss., was destroyed by fire, May 4, with loss estimated at about \$100,000. The company has been devoting its plant to the production of materials for the Government.

The Pine Bluff Battery Co., Pine Bluff, Ark., has been incorporated with a capital of \$10,000 to manufacture electric batteries. R. G. Craig and Gordon M. Rudd are the principal incorporators.

The Black Wire & Steel Co., Kansas City, Mo., will build a one-story addition, 40 x 100 ft., to its wire rope works at Twenty-first Street.

Texas

Austin, May 25.

The municipal waterworks plant, Gorman, which was recently destroyed by fire, will be rebuilt and new equipment purchased.

The mattress factory at Dallas owned by Tom B. Burnett, which was recently destroyed by fire, will be rebuilt at a cost of about \$50,000.

The Lone Star Oil & Refining Co., Coleman, has purchased a site of 17 acres upon which it will construct an oil refinery with a daily capacity of 500 bbl. The plant will cost about \$50,000.

The Baxter Oil Well Supply Co., Houston, will construct a plant at Wichita Falls for manufacturing oil well and drilling machinery.

F. M. Potter, Kansas City, Mo., and associates, will construct an irrigation system at Olmita and install a pumping plant for irrigating about 2300 acres.

The Beaver Valley Oil & Refining Co., Cisco, which has been incorporated with a capital stock of \$600,000, will construct an oil refinery.

The Standard Battery Co., Fort Worth, which has a capital stock of \$25,000, will install a plant for the manufacture of electric batteries. A. J. Combs is interested.

The Mid-Kansas Oil & Gas Co., Findlay, Ohio, which has a capital stock of \$2,000,000, has been granted a permit to do business in Texas and plans to build a large refinery at Thurber. The company has extensive oil interests in central western Texas.

The Petroleum Pipe Line Co., Houston, which has a capital stock of \$600,000, will construct a pipe line system from Houston to the Gulf Coast oil fields.

The National Shipbuilding Co., Orange, has been awarded contracts by the Government for the construction of 16 more wooden ships of the type of the War Marvel, recently launched.

California

Los Angeles, May, 21.

The Pacific Electric Railway Co., Pacific Electric Building, Los Angeles, has awarded a contract to the Wurster Construction Co., Central Avenue, for the erection of new shops at Torrance, including car works, 180 x 400 ft.; heavy machine shop, 180 x 450 ft.; forge shop, 150 x 200 ft.; erecting shops, 180 x 450 ft.; paint shop, 180 x 450 ft.; power plant, about 60 x 120 ft., and other structures. The entire works are estimated to cost about \$1,000,000.

The American Trona Corporation, San Pedro Harbor, Los Angeles, has filed plans for the construction of a one-story forge works and one-story pattern shop on Pacific Avenue.

The General Petroleum Co., Higgins Building, Los Angeles, has had plans prepared for a new one-story machine shop, 40 x 100 ft., on Santa Fe Avenue.

The McIntyre Pump Co. of California, Los Angeles, has been incorporated with a capital of \$50,000 to manufacture pumping machinery. J. W. Henderson, Henry F. Wheeler and Frank C. Ensign, Los Angeles, and Loren B. Curtis, Riverside, are the incorporators.

Directors of the Ontario Power Co., Ontario, Cal., operated by the Ontario Water Co., have approved plans for the construction of a new electric power plant in San Antonio Canyon to cost about \$60,000. It is proposed to have the plant ready for operation early in January. Glenn D. Smith is general manager.

D. W. Payne & Son, Los Angeles, have organized to operate a sheet metal works at 328 East Second Street. Daniel W. Payne, 1714 West Fifty-third Street and E. L. Payne head the company.

The Pittsburg Foundry Co., 4801 South Alameda Street, Los Angeles, has filed plans for the construction of a one-story addition to its foundry, 50 x 100 ft. It specializes in the production of gray iron castings.

The Southwestern Shipbuilding Co., San Pedro Harbor, Los Angeles, is planning for the construction of new buildings, to include a one-story pipe shop, 60 x 130 ft.; one-story joiner and pattern shop, 60 x 160 ft.; general works, 60 x 240 ft., and drafting room, 80 x 400 ft. The estimated cost is \$22,000.

The Hanford Iron Works, Hanford, Cal., has been incorporated with a capital of \$100,000 to manufacture iron and steel specialties. W. J. Hanford and P. J. Hubbell are the principal incorporators.

Considerable transmission machinery will be purchased by the California Growers' Association, Douglas Building, Los Angeles, for its new canning works, to be erected at San Jose at a cost of over \$200,000. The equipment will include leather belting, shafting, pulleys, etc. Vernon Campbell is manager.

The National Brass Works, Los Angeles, has been incorporated with a capital of \$50,000 to manufacture brass specialties. W. W. Witherby, H. L. Hartman and Leonard Ruegg are the incorporators.

George R. Perry, Chowchilla, Cal., has awarded a contract to James Daly, Fresno, for the erection of a one-story machine shop, 50 x 100 ft. It will be equipped to handle automobile and tractor engine construction and repairs, with overhead cranes, etc.

Carl Leonardt, Los Angeles, president of the Southwestern Portland Cement Co., has organized a company to build a plant for the construction of concrete-steel vessels. A lease has been secured from the Harbor Commission covering 10 acres in the west basin of Los Angeles Harbor. The initial works are estimated to cost about \$25,000.

The Reliance Mfg. Co., Pasadena, Cal., has been incorporated with a capital of \$50,000 to operate a machine shop and foundry for the manufacture of castings and other iron products. Wilbert Morgrage and W. M. Thompson, Pasadena, and John A. Powell, Los Angeles, are the incorporators.

The Terminal Ways & Machinery Co., Long Beach, Cal., has been incorporated with a capital of \$50,000 to operate a ship repair works, manufacture machinery, etc. Charles Beyer, W. F. Fisher and Charles A. Gee, Long Beach, are the incorporators.

Transmission equipment, including belting, shafting, pulleys, etc., and other machinery will be installed in the new packing plant to be erected by Rosenberg Brothers & Co., 706 G Street, Fresno, Cal., at a cost of about \$200,000. The Clinton Construction Co., Townsend Street, San Francisco, has the contract for erection. A one-story electric power plant, 45 x 85 ft., will also be constructed.

Fire, May 21, at the plant of the Fowler Aeroplane Corporation, San Francisco, destroyed a large portion of the works, and fifteen airplanes in different stages of construction. The loss is reported at \$500,000.

The Pacific Northwest

SEATTLE, WASH., May 21.

The feature of the past week was the merger of the Skinner & Eddy Corporation and the Seattle Construction & Dry Dock Co., with a resultant order for \$100,000,000 for steel ships, placed with the Skinner & Eddy Corporation. This is believed to be the greatest industrial event in the history of the Northwest.

Every possible effort is being made by shipbuilders to speed up the production of vessels and several plants have cut their usual time one-half. The establishment of a number of plants especially designed for equipping ships has obviated long delays in receiving machinery from the East, and the expense in shifting vessels to other points for equipment.

M. G. Thomle, president Norway-Pacific Construction & Drydock Co., Seattle, announces that work will start at once on the proposed shipyard and drydock to be built in Everett, Wash.

The Skinner & Eddy Corporation, Seattle, plans the construction of a large sectional drydock in connection with its plant. It will be built in 90-ft. sections.

The plant of the Winslow Shipbuilding Co., Eagle Harbor, recently taken over by D. W. Hartzell, Inc., Seattle, is being remodeled and equipped with new machinery. It will be operated on two 8-hr. shifts.

The Douglass Brothers Co., Aberdeen, Wash., has recently been reorganized and will construct a new plant for the manufacture of machinery and parts for auxiliary schooners. The present plant will be used as a nucleus for the large one.

The Griffin Wheel Works, South Tacoma, Wash., has contracts for 16,000 car wheels, at an estimated cost of \$240,000, for the freight cars to be built in this district.

The Western Drop Forge Co., Seattle, which started its plant a few months ago, has been compelled to double its floor space and add a large amount of new equipment. Four large hammers and presses have been installed and a new die-sinking room will be built.

The Northport Mfg. Co., Northport, Wash., plans to move its plant to another location and is considering Spokane. The principal product is a four-cut saw.

The Nelson Iron Works, 45 Spokane Street, Seattle, will erect a machine shop, 80 x 180 ft., to cost \$6,000.

The American Foundry Co., Seattle, recently incorporated, has completed plans for its proposed foundry, the main building to be 75 x 120 ft.

The A. Gulowsen, Inc., Christiania, Norway, manufacturer of "Grei" heavy-oil engines, has incorporated the Gulowsen Grei Engine Co., 810 Alaska Building, Seattle, Wash., and is erecting a factory for the manufacture of these engines for the American trade. C. Olson is in charge.

Canada

TORONTO, May 27.

Orders for machinery and tools for munitions work show no sign of falling off. The great difficulty is to secure machine shop capacity to turn out the special war-purpose equipment so insistently called for. Activity has been further stimulated by the placing of additional shell orders in Canada by the United States Government. New plants for the manufacture of war materials are being erected at Montreal and Toronto, while others are making changes so as to manufacture 9.2-in. shells where previously they were turning out the 6-in. size. A United States company, represented in Toronto by the Holden Morgan Co., has purchased a site of nearly four acres for a large munitions plant. It is claimed that the company will turn out larger shells than any hitherto manufactured in Canada. Construction work has begun on the plant, which is to be completed within 60 days.

The Canadian Welding Works, Ltd., has taken over the business and plant of the Dominion Architectural Iron Works, Ltd., 175 McCord Street, Montreal, and will move into the premises of the latter company immediately. It will continue the business of the Dominion company and enlarge it.

The plant of the Huntley Co., Ltd., Tillsonburg, Ont., which was destroyed by fire last March, will be replaced by a building 120 x 180 ft., at a cost of about \$40,000.

R. A. Thompson, Lynden, Ont., is in the market for a 10-hp., 550-volt, three-phase, 25-cycle motor.

The Dominion Steel Foundry Co., Hamilton, Ont., has had plans prepared for the erection of a new plant which will be used for filling a United States Government order for forgings amounting to \$2,500,000.

The E. Long Mfg. Co., Orillia, Ont., manufacturer of saw and shingle mill machinery and shafting, will build a two-story addition.

The Wilson Machine Co., 151 Prince Street, Montreal, has commenced the erection of a two-story brick factory, to cost \$10,000.

The plant of the Canadian Car & Foundry Co., Fort William, Ont., was damaged by fire May 23, with a loss of \$15,000.

The capital stock of Jenkins Brothers, Ltd., Montreal, has been increased from \$200,000 to \$400,000 to extend its business in the manufacture of machinery, tools, etc.

The Massey-Harris Co., Ltd., has increased its capital stock from \$15,000,000 to \$25,000,000.

The Fairfax Forgings, Ltd., Montreal, has been incorporated with a capital stock of \$1,500,000 by Louis A. David, Louis P. Crepeau, S. H. R. Bush and others to manufacture machinery, engines, boilers, etc.

The Saxon Motors Corporation of Canada, Ltd., Windsor, Ont., has been incorporated with a capital stock of \$50,000 by Alexander R. Bartlet, Harvey L. Barnes, Ralph McLean and others to manufacture automobiles, trucks, motors, engines, etc.

Frank Waterhouse & Co. of Canada, Ltd., Vancouver, B. C., has been incorporated with a capital stock of \$50,000 by Frank Waterhouse, Neal H. Begley and John R. Lane, Seattle, Wash.; David G. Marshall, Vancouver, B. C., and others to build boats.

The Canadian Buttons, Ltd., Montreal, has been incorporated with a capital stock of \$25,000 by Maxwell Goldstein, Westmount, Que.; John A. Angel, Max Bernfeld and others of Montreal to manufacture metal buttons, molds, buckles, etc.

The Motor Trucks Co., Brantford, Ont., has been awarded a United States Government contract for the manufacture of 9.5-in. and 4.7-in. high explosive shells, amounting to approximately \$7,000,000. The company will erect an addition to its plant to be completed in about 45 days, the total expenditure for which will amount to \$1,000,000. The completion of the contract is January, 1920.

The Romeo Foundry Co., Sarnia, Ont., has received a \$2,000,000 order from the General Motors Co. and will install additional equipment to handle the contract.

The Leaside Munitions, Ltd., Leaside, Toronto, has started work on the erection of a brick machine shop to cost \$30,000.

The International Business Machines Co., 270 Dundas Street West, Toronto, has awarded contracts for the erection of an addition to cost \$40,000.

The Holden-Morgan Co., 579 Richmond Street West, Toronto, will build a galvanized iron and frame machine shop to cost about \$30,000.

William and Ed Johnson, Lloydminster, Alta., will build an electric light plant to cost \$60,000.

Milton & Prentiss, Traders Bank Building, Toronto, are in the market for one 40 or 50-hp., 115-volt, direct-current generator, direct-connected to steam engine.

Government Purchases

WASHINGTON, May 27.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, as follows, bids closing in the near future were not specified: Schedule 4451½, for Washington, 41 engine lathes, opening June 14; schedule 4454½, for Washington, 11 milling machines, 6 turret lathes, 18 screw machines, 6 grinding machines, 2 engine lathes, 4 drilling machines and 4 chucking machines, opening June 11; schedule 4469½, for Washington, 25 engine lathes, opening June 14; schedule 4477½, for Washington, boring and slotting machines, planers, etc., opening June 14; schedule 4478½, for Washington, shapers, screw and milling machines and lathes, opening June 14; schedule 4519½, for Washington, 4 motor-driven table planers, opening May 31; schedule 4529½, for Philadelphia, 59 valve seat outfits, opening May 31; schedule 4530½, for Washington, 1 radial drill, opening May 31, schedule 4535½, for Norfolk, 1 pipe and nipple machine, opening May 31; schedule 4551½, for Norfolk, 1 pneumatic power hammer, opening June 3.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until June 10, under specification 3028, for furnishing cranes for aero storehouses.